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Excavations in Mancos Canyon, Colorado

By ERIK K. REED

With appendices by

T. D. Stewart, E. T. Hall, Raymond W. Gilmore and Herbert Friedmann, and Volney H. Jones

ROBERT ANDERSON, *Editor*

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The University of Utah Anthropological Papers are a medium for reporting to interested scholars and to the people of Utah research in anthropology and allied sciences bearing upon the peoples and cultures of the Great Basin and the West. They include, first, specialized and technical record reports on Great Basin archeology, ethnology, linguistics, and physical anthropology, and second, more general articles on anthropological discoveries, problems, and interpretations bearing upon the western region, from the High Plains to the Pacific Coast, insofar as they are relevant to human and cultural relations in the Great Basin and surrounding areas.

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EXCAVATIONS IN MANCOS CANYON, COLORADO

Erik K. Reed

With appendices by T. D. Stewart,

E. T. Hall, Raymond W. Gilmore

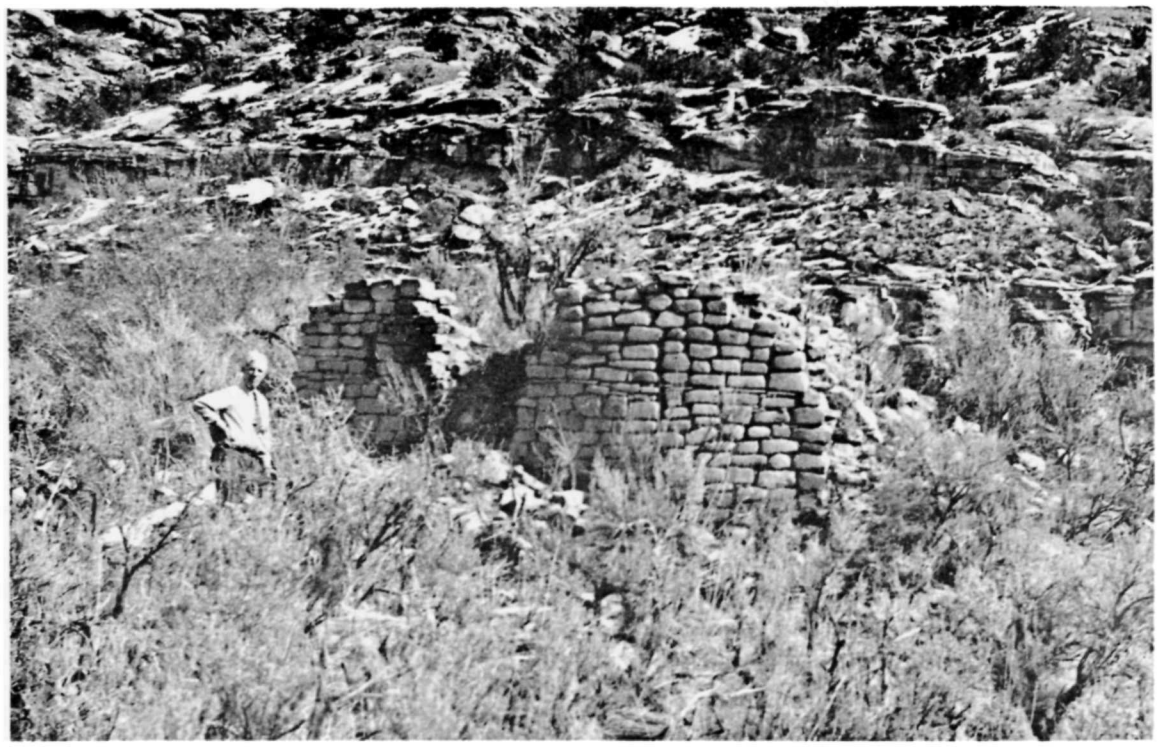
and Herbert Friedmann, and Volney H. Jones

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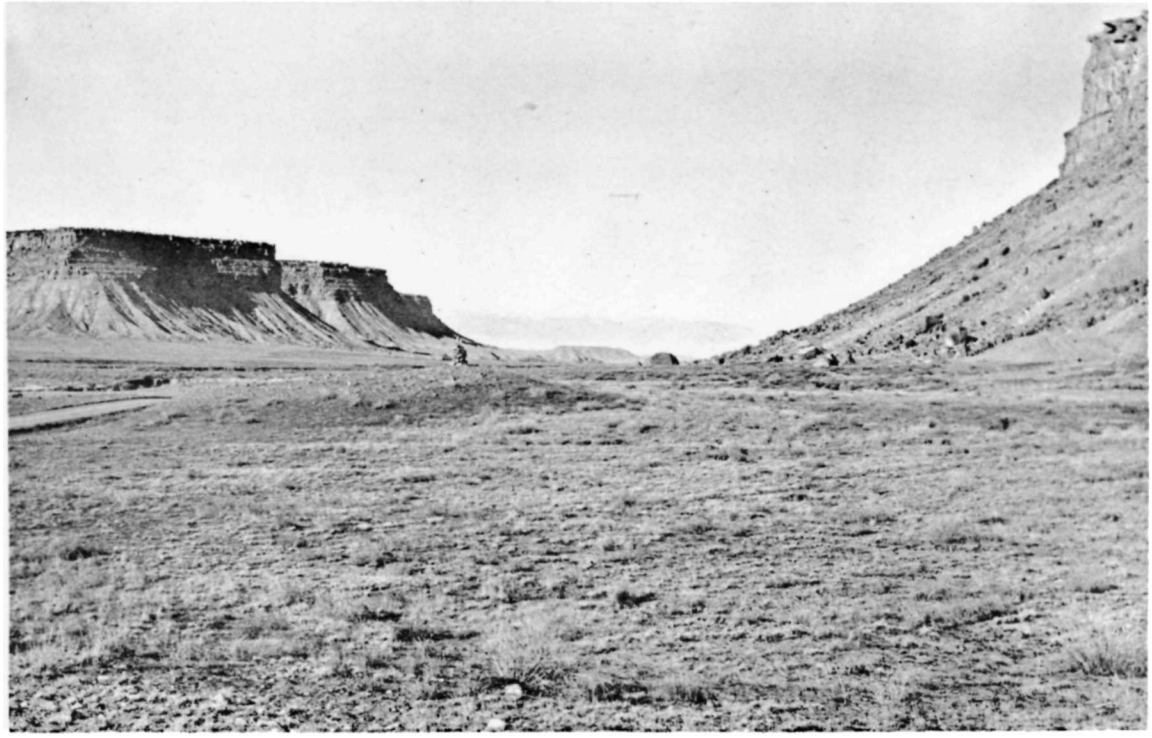
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ANTHROPOLOGICAL PAPERS

Department of Anthropology
University of Utah



A. Jesse L. Nusbaum and the double-walled tower near Site 16.



B. Looking west through the mouth of Mancos Canyon near Site 1.

FOREWORD

We are pleased to bring to publication this important and long delayed paper by Erik K. Reed of the National Park Service. Special acknowledgment for editing the report in its entirety is due Gordon D. Gibson, now a member of the staff of the U. S. National Museum, Smithsonian Institution, who during his service at the University of Utah was assistant editor of this series. Also acknowledged is Miss Dee Ann Suhm's assistance in the checking of the final manuscript and in seeing the paper through the press.

Robert Anderson
Editor, University of Utah
Anthropological Papers

PREFACE

The present study was written during the fiscal year 1943 as the required report on a federal government archeological project, excavation in the spring of 1942 of small sites damaged or threatened by road construction in Mancos Canyon in southwestern Colorado, on the Ute Reservation just below Mesa Verde. A preliminary summary was published at that time (Reed 1943). In 1944 this report was accepted as my doctoral dissertation at Harvard University.

A few revisions were made in the notes and bibliography of the report immediately after return in March 1946 from military service, and a few insertions made in the 1943 text, particularly to call attention to the McElmo-like pottery of Painted Cave in northeastern Arizona and to the unique vessel, combining black-on-white and polychrome techniques and designs, found at Site RB 568 in the Tsegi (Kayenta district). Additional revisions have been made during 1947.

The excavations were carried out for the Indian Service under an inter-bureau agreement between the National Park Service and the Office of Indian Affairs for protection and salvage of archeological remains along Indian reservation road locations. A road up Mancos Canyon to Johnson Canyon, put in by CCC-ID in 1936 and worked on further in 1941-42, had damaged four of those sites badly, as well as completely destroying, beyond hope of salvage, at least two others. The line of the proposed road relocation would demolish the four sites further, and threaten the fifth. Salvage excavations were arranged by Jesse L. Nusbaum, Senior Archeologist of the Park Service, whom the writer accompanied on a meeting and inspection with Indian Service officials on June 19, 1940, for that purpose.

The field work, performed in the spring of 1942, included excavations in five small sites along the north side of the Mancos. Structures studied included three Basket Maker III pit structures; a small pueblo unit and its kiva; another similar site incompletely cleared (the kiva merely tested); a pueblo unit of four rooms including a small intramural kiva; a fourth pueblo unit consisting of three little surface rooms and a large kiva (the kiva merely tested). Altogether seventeen burials were found, ranging from Modified Basket Maker through late Developmental Pueblo, mainly infants and all in poor condition. A small collection of stone, bone, and pottery specimens was recovered, and in addition a comparative abundance of fragmentary potsherd material.

The field work was performed on temporary assignment from the Region Three Office of the National Park Service to the U. S. Indian Service, with Ute and Navajo labor furnished by the Indian Service. Laboratory study and writing of the report were done at Santa Fe, New Mexico, at the Region Three Office and at the Laboratory of Anthropology. Indian Service and National Park Service officials concerned with the archeological project were uniformly cooperative and helpful. The four Ute Indians who worked throughout the project, and most of the additional Utes and Navajos who were on the job at intervals, proved excellent workmen.

Special mention must be made of the various and extensive help afforded by the Laboratory of Anthropology, Inc., at Santa Fe. Storage space and working space were provided me, and the facilities and comparative material of the Laboratory made fully available. Stanley Stubbs and the late H. P. Mera gave freely of their time and knowledge. Stubbs photographed specimens for me and aided immeasurably in miroscopic study of pottery as well as in analysis of specimens generally. The constant assistance and guidance of both men are especially appreciated.

The cooperation of the following specialists is also acknowledged: Ross A. Maxwell of the National Park Service for identification of rocks and minerals; Volney H. Jones for a report on vegetal materials; E. T. Hall, Jr., for a report on tree-ring material; T. D. Stewart of the National Museum for his study and discussion of the human skeletal remains; and zoologists R. W. Gilmore and H. Friedmann of the National Museum for identification of mammal and bird bones.

This report is published with the permission of the Director, National Park Service.

Santa Fe, New Mexico, January 1948.

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CHAPTER I

INTRODUCTION

The Southwestern Archeological Area

For the archeologist, the Southwest extends from the lower Colorado River east across Arizona and western New Mexico to the Pecos Valley, the approximate eastern limit of the occurrence of pueblo ruins. The area reaches from the North Mexican states of Sonora and Chihuahua north to the Dolores River in southwestern Colorado, to central Utah, and to the Moapa Valley (Muddy River) and lower Virgin River in southeastern Nevada. Painted pottery is found throughout this range. Pueblos built of stone or adobe characterize all of it except the western Arizona desert, which is a marginal area related also to southern California.

Stonework of early prepottery peoples is known at certain sites in the Southwest. A distinctive advanced culture, called by the Pima term Hohokam, is found in the southern Arizona desert. Various other cultural manifestations occur in the Southwest. The most conspicuous and best known, however, is the Pueblo pattern of the plateau and mountain zones.

The Pueblo pattern is characterized by large and small buildings of stone and/or adobe, particularly the great pueblos which developed from primitive early structures. Polished pottery and corrugated pottery, various stone and bone implements, and ornaments of shell and other materials are found. Agriculture was well developed without extremely intensive irrigation. Inhumation of the dead and cranial deformation (cradleboard flattening of the back of the skull) are characteristic.

The sequential development of Puebloan culture is best known, and has been worked out with the greatest precision and certainty and detail, on the semiarid Colorado Plateau, north of the forested mountain zone of the Mogollon Rim country. The prehistoric culture of the drainage of the San Juan River, and of adjacent sections of the northern drainage of the Little Colorado and the upper Rio Grande, differs in several important respects from the Mogollon division of the Puebloan pattern in central Arizona and southern New Mexico (Colton 1939; Haury 1936a; Haury 1940; Martin 1943; Reed 1946). Certain of these features, such as kivas and gray corrugated pottery, are not duplicated in any other archeological complex anywhere.

This highly distinctive complex is called by the Navajo name Anasazi. Restriction of the term Anasazi to the northern or gray ware Puebloans is implied in Dr. Kidder's original proposal, "The word Anasazi. . . would apply to the Basket Maker and to those Pueblo groups which can be shown to have derived the basic framework of their material culture from the Basket Maker" (Kidder and Shepard 1936, 590).

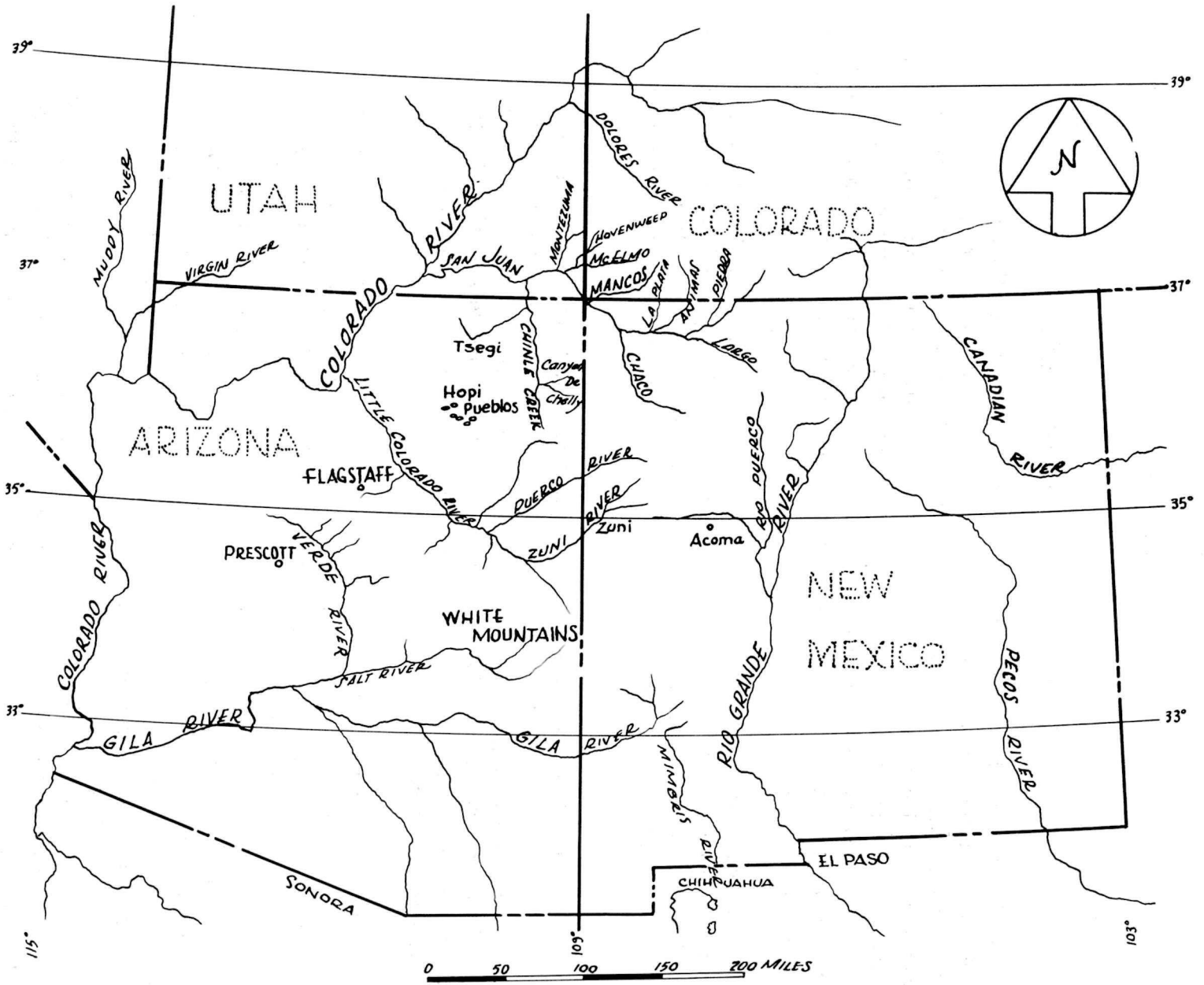


Fig. 1. The Southwestern archeological area.

The controversy among Southwesternists as to the degree of separateness of Mogollon from Anasazi is largely a matter of definition and terminology, which can be resolved by calling both "Pueblo" (Reed 1942), since they obviously constitute one pattern as against Hohokam or Gila-Sonora (Kroeber 1928), but calling only the distinctive northern complex "Anasazi."

The Anasazi or Northern Pueblo culture continued east from the San Juan into the adjacent upper Rio Grande, where it has survived in large part to the present day. It extended west across the middle Colorado to the Virgin River drainage in southwestern Utah and southeastern Nevada. The sequence is incomplete and less well known in these peripheral districts.

Anasazi culture is characterized by the presence of circular rooms--in the early periods, semisubterranean dwellings; in later periods, kivas. Kivas are ceremonial chambers accompanying the large cellular pueblos of rectangular living and storage rooms. Kivas are generally semisubterranean or intramural in the stone pueblos of the developed prehistoric culture. They are mainly above ground in the modern adobe pueblos of the Rio Grande.

Anasazi pottery is mainly of kinds which are considered reduced-fired--plain and corrugated unpolished gray ware, and black-on-white painted pottery (slipped and polished except in the first ceramic period). The one group of definitely oxidized pottery thought to be indigenous in the Anasazi area, San Juan Orange Ware, is discussed at length in this paper.

Stone axes are simple, usually merely suitably shaped river pebbles of hard rock with only the blade polished, and notched or fully grooved for wrapped hafting. The three-quarter groove for J-hafting, characteristic in Hohokam and Mogollon groups and in western Mexico, does not occur.

Burial is characteristically flexed or semiflexed primary inhumation. Extended inhumations are uncommon, and cremation (a Hohokam trait) is rare. Cranial deformation is predominantly of the so-called lambdoid type.

The continuous development of Anasazi culture in the San Juan and adjacent districts has been classified into several successive periods, approximately dated on the basis of tree ring studies:

1. Preceramic or Early Agricultural period: Basket Maker, or Basket Maker II, A.D. (?)-450 (earliest tree-ring dates around A.D. 200).

   No true pottery, house type not well known, bow and axe not present. Skulls undeformed. Various textile products and wooden objects, notably the atlatl

(spearthrower) and the grooved curved club; excellent baskets and sandals. Cultivation of corn (maize), not beans.

2. Period of development: Basket Maker III, or Modified Basket Maker, A.D. 450-750.

Pit houses, squarish or round, generally with antechamber; slab-lined storage cists. Pottery unpolished plain gray (with so-called fugitive red exteriors common) and black-on-gray. In the western San Juan a polished red-on-orange appears toward the end of this period. Notched stone axes and grooved stone mauls. Small projectile points indicating general use of the bow and arrow. Beans cultivated, turkeys kept. Skulls undeformed, mesocephalic tending to dolichocephalic.

3. Period of transition: Pueblo I or Developmental Pueblo (and continuation of Modified Basket Maker in peripheral districts, lacking several of the following traits), A.D. 750-900.

Pithouses (winter dwellings and/or ceremonial chambers), and surface structures or rows of contiguous living and storage rooms, built largely of perishable materials. Pottery plain and coil-neck gray, slipped and polished black-on-white with a simple style of decoration, a red-on-orange and black-on-red series in the western San Juan. Notched-pebble axes. Cotton. Cranial deformation general, normally of the lambdoid style.

4. The developed culture: Classic Pueblo (with continuations of features of the preceding period in northeastern Arizona), Pueblo II and III, A.D. 900-1300.

Stone pueblos with circular kivas; corrugated gray ware and advanced black-on-white. Full-grooved stone axes. Cranial deformation universal, lambdoid more common than vertical-occipital.

This last general epoch can be divided into two periods which differ between east and west more considerably than do the early stages:

Western San Juan and Northern Little Colorado; Kayenta Branch.

4a. Pueblo II, A.D. 860-1130.
Circular masonry pithouses and surface storage structures.
Black Mesa Black-on-white, Tusayan Corrugated and Tusayan Black-on-red.

4b. Pueblo III, A.D. 1130-1300.

Small stone pueblos with circular kivas; a final phase, 1250-1300, of large cliff dwellings in the Tsegi. Several black-on-white types, degeneration of corrugated to rough gray; Tusayan Polychrome and its 1250-1300 variants.

Eastern San Juan and Northeastern Little Colorado (large and small masonry pueblos with circular kivas, generally subterranean but very frequently intramural).

4a. Early Classic, Pueblo II or III-A, A.D. 950 (?)-1150 (Chaco period).

Fine masonry, great kivas, Chaco-Mancos black-on-white types, variety in gray ware.

4b. Late Classic, Pueblo III-B, A.D. 1150-1300 (Mesa Verde period).

Towers, structures of bizarre ground plan, cliff dwellings, neatly indented corrugated and Mesa Verde Black-on-white.

By about A.D. 1300, probably because of arroyo-cutting brought on by the drought period of 1276-1299, the entire San Juan drainage was abandoned by the Anasazi (Reed 1944b). The people of the Tsegi undoubtedly went to the Hopi country, joining elements from other directions whose southern or Little Colorado culture, of Mogollon derivation, seems to have preponderated in the formation of historic Hopi culture, although the Hopi language may well have been that of the westerly Anasazi (the Kayenta branch).

The eastern Anasazi, of the Mesa Verde focus or period, evidently moved to the Rio Grande. The previous Puebloan occupants of the upper Rio Grande were pure Anasazi in culture; western influences reached the Rio Grande only later in the fourteenth century. Pottery obviously derived from Mesa Verde Black-on-white appears in quantity on the Rio Grande at the time of the abandonment of the San Juan. Black-on-white types persisted relatively late in certain sections of the Rio Grande, and kivas are still of circular form in the modern Rio Grande pueblos.

I find the terms Basket Maker III, Pueblo I, Pueblo II, Pueblo III more convenient than either Modified Basket Maker, Developmental Pueblo, Early Classic, Late Classic; or the more localized corresponding sequence, La Plata focus, Piedra focus, Mancos focus, Mesa Verde focus. In addition, however, I am prone to use "Mancos," "Chaco," or "Mancos-Chaco times" for Early Classic (Pueblo II or III-A), and "Mesa Verde period" for Late Classic (Pueblo III or III-B). The various designations of those periods or complexes are summarized in Table 1. The subject is discussed at greater length in the final section of this paper.

The canyon of the Mancos River is in the heart of the San Juan country, and, as could be expected, archeological remains in it are pure Anasazi in type. Material

representing all four of the ceramic periods listed above was found in the excavations carried out in the spring of 1942. No Pueblo I structures or Mesa Verde burials were excavated, however; and the amounts of material are very small for all categories, even in the best-represented stage, the Mancos focus of the Chaco period.

Previous Work in the Mancos District

In the summer of 1874 the famous pioneer photographer W. H. Jackson, who died in 1942 at the age of 99, came down Mancos Canyon from Mancos Valley to the Montezuma Valley, noting and photographing ruins, and then north to Aztec Springs (Yucca House National Monument) and the McElmo drainage, heading the separate photographic party for that summer of the Hayden Survey (Jackson 1876).

The brief traverse was the first recorded expedition, archeological or other, into the Mesa Verde. Previous explorations across southwestern Colorado--by Pedro Rivera in 1761, Frayles Dominguez and Escalante in 1776, Macomb and Newberry in 1859--had come from New Mexico northwestward and skirted the northeast cliff of the Mesa Verde. Jackson's was probably also the first deliberate archeological expedition in the Southwest, previous archeological information having been collected incidental to military and geological reconnaissances.

Jackson noted ruin mounds in Mancos Valley and upper Mancos Canyon, a number of small cliff structures on ledges, and the double-walled tower which is 16 miles in from U. S. Highway 666 (Frontispiece, A). Unfortunately, he made no observations or photographs in the next 10 miles, the area of the 1942 project:

> "Passing on down the cañon, not stopping now to notice the more ordinary forms of ruins. . . we camped at sunset. . . within a half-dozen miles of the outlet of the cañon. We had not discovered any more of the high cliff-houses during the day" (Jackson 1876, 374).

In those lowest few miles of Mancos Canyon Jackson reported a number of little rooms on high ledges in the cliffs and three structures in the open.

The first known description in print of the Mancos Canyon ruins, and of Yucca House and the Hovenweep (McElmo) ruins, was a communication to the New York Tribune by Ernest Ingersoll, then a young zoologist of the Hayden Survey, who accompanied Jackson. The dispatch appeared in the Tribune of November 3, 1874, and was reprinted by the Museum of the American Indian (Heye Foundation) slightly over half a century later (Ingersoll 1928).

The following summer W. H. Holmes, then a young assistant geologist of the Hayden Survey, made an archeological reconnaissance of the southwestern

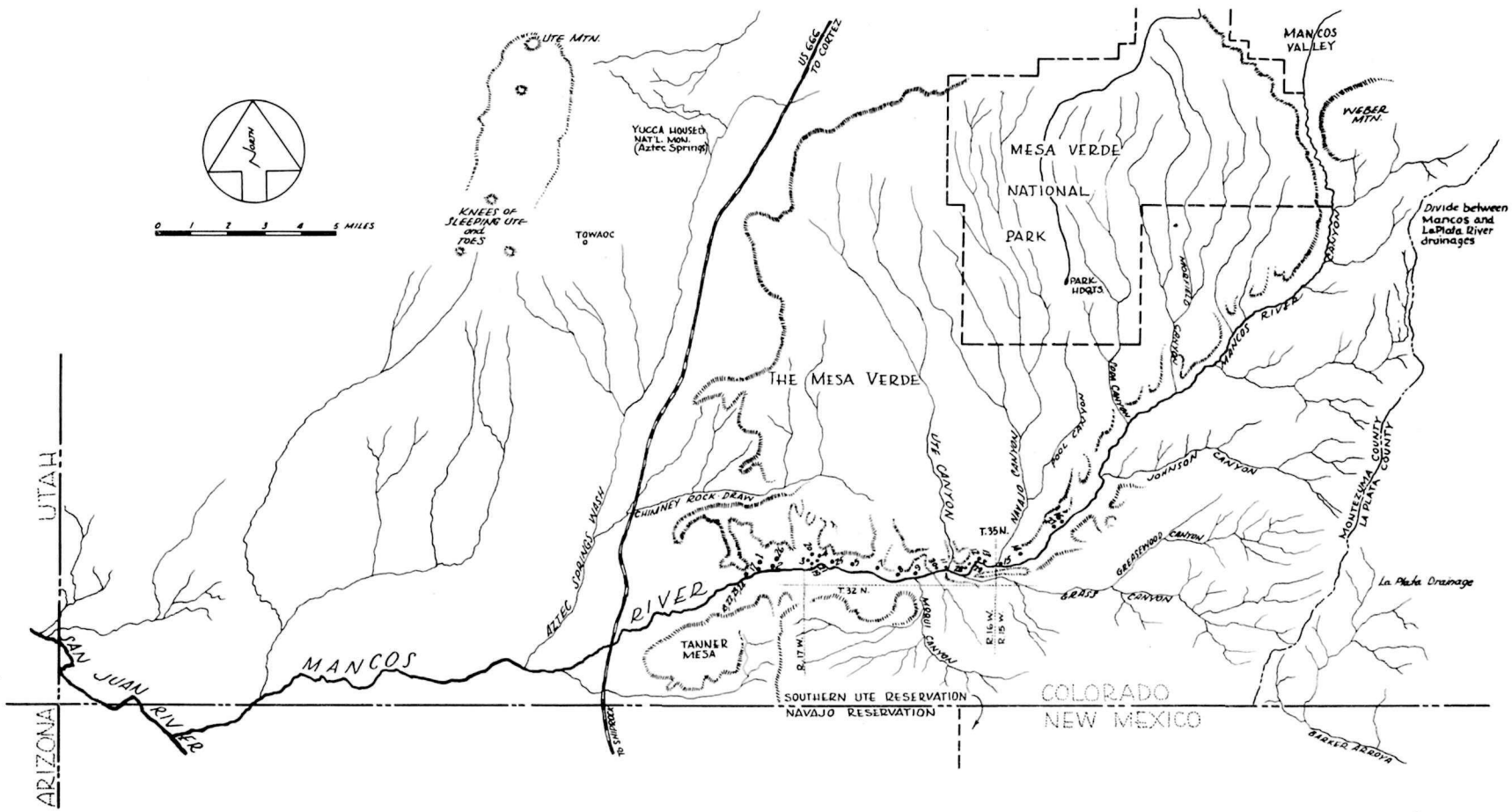


Fig. 2. The Mancos River Drainage.

Colorado area, thereby commencing his distinguished career as an anthropologist. Holmes visted the group at the confluence of McDermott Arroyo and the La Plata River (Holmes 1878, 387; Morris 1939, vi and fig. 2); ruins on the San Juan near Shiprock (these, so far, in New Mexico); towers and small cliff ruins on the Mancos, including the double-walled tower and in the mouth of Cliff Canyon, the site known as Sixteen-Window House; Yucca House; and ruins in the McElmo drainage (Holmes 1878, 394-396, 399-401).

W. H. Jackson was out again in 1875 also, through the Hovenweep (Yellow-jacket)drainage to San Juan, along the master stream and up the Chinle, visiting Poncho House, and then to Comb Wash and Montezuma Creek in southern Utah (Jackson 1878).

The great ethnologist Lewis H. Morgan made a trip to the upper San Juan area of the northern southwest in the summer of 1878. He examined Aztec, the first pueblo ruin he had seen, and went by way of the La Plata Valley to Mancos Valley. He visited a small cliff dwelling in upper Mancos Canyon, then moved to the head of McElmo Canyon, in the upper Montezuma Valley near Cortez, where he saw a number of pueblo ruins including the Mitchell Spring double-walled tower and the Mud Spring triple-walled tower, and went by Pagosa Springs to the living pueblo of Taos (White 1942; L. H. Morgan 1881).

Morgan's two grand-nephews accompanied him on this expedition, and one of them read a paper at the St. Louis meeting of the A. A. A. S. later that year describing the cliff ruin visited on the Mancos (W. F. Morgan 1878).

In 1879-1881 the Wetherill family settled in Mancos Valley, east of the Mesa Verde near the little town of Mancos, Colorado, and for the next several years the Wetherill boys hunted and worked ruins as well as cattle in the canyons of the Mancos and its tributaries, concentrating on the great Mesa Verde cliff pueblos beginning in 1888 (Gillmor and Wetherill 1934).

Travelers and scientists--in some numbers,for that time in that country--were guided to the Mesa Verde ruins by the Wetherills. Notable among these was the Swedish student Gustave Nordenskiold, who carried out in 1891 the first published archeological excavations at several of the major cliff dwellings in the San Juan drainage, and visited and photographed cliff ruins in Johnson Canyon (Gillmor and Wetherill 1934, 38-39; Nordenskiold 1893).

Probably the Wetherills took many of their guests on down Mancos Canyon to the double-walled tower; they did one at least, in 1890, the traveler and mountaineer Frederick H. Chapin, who wrote a book about the area (Chapin 1890 and 1892).

Chapin mentions the double-walled tower and the smaller tower near it and gives a photograph of the latter; he also describes the cliff dwellings of the Mesa Verde and of Johnson ("Acowitz") Canyon, with quite a little information on the excavations of the Wetherill boys in those sites.

The eminent pathologist T. Mitchell Prudden, a founder of the American Anthropological Association, was a guest and friend of the Wetherills on his many southwestern vacations (Anon. 1927). From 1892 onward Dr. Prudden became an important figure among early serious contributors to Southwestern archeology.

Prudden's work was done entirely in the northern part of the San Juan drainage, in southwesternmost Colorado and southeastern Utah, although he explored the southern drainage, and particularly in the Hovenweep (Yellowjacket) and Montezuma Creek drainages (Prudden 1903; 1914; 1918). Prudden did no actual work in the Mancos drainage, though he visited the small cliff ruins of the lower Mancos (Prudden 1903, 252) as well as the great ones of its northern tributary canyons.

The first technical paper published by Prudden was an excellent thorough survey of the ruins of the San Juan drainage. His subsequent two papers described excavations in 1913 and 1915 in small sites which accurately defined important architectural types.

In 1906 a portion of the Mesa Verde containing the most outstanding ruins was created a national park by act of Congress; like the Antiquities Act, this was largely at the instance of the late Edgar L. Hewett.

From the following year to 1922, J.W. Fewkes--a marine zoologist for fifteen years and then the outstanding Southwestern anthropologist of his generation--worked in the ruins of the park area, both cliff dwellings and open sites, excavating and restoring, and examined the the instructive ruins of the McElmo drainage and other adjacent districts. (Fewkes 1909-1923).

Additional excavation and repair work on the Mesa Verde was done thereafter by the National Park Service, mainly under the direction of Jesse L. Nusbaum. In the fall of 1940 two Basket Maker III pit houses on the Mesa Verde were excavated by Al Lancaster for the National Park Service (Lancaster and Watson 1943).

In 1908 the late Sylvanus G. Morley, the eminent Mayanist, began his archeological career with the excavation of Cannonball Ruin near Hovenweep National Monument (Morley 1908). To the west on Montezuma Creek in Utah, A.V. Kidder's first important field work was also done in 1908, mainly on Alkali Ridge (Kidder 1910). More extensive excavations on Alkali Ridge, in earlier sites, were carried on for Peabody Museum by J.O. Brew in 1931-1933 (Brew app. C in Martin 1939; Brew 1946). The full report on this project by Brew, published after this manuscript was originally prepared, includes a review of previous work in the San Juan and extremely

important discussions of problems of classification and interpretation.

Meanwhile, Earl H. Morris worked in the area southeast of the Mesa Verde, from just east of Mancos Canyon to Aztec on the lower Animas in New Mexico. Morris worked in Johnson Canyon cliff ruins and Basket Maker III-Pueblo I open sites on the mesas between Johnson Canyon and the La Plata drainage in 1913 and 1914 (Morris 1919a), and again in 1925 and 1929 (Morris 1939). He excavated sites within the La Plata drainage in 1915-16, 1921-22, 1927, and 1930. The period 1917-1920 Morris spent on the Aztec Ruin.

J. A. Jeancon was in the field for the State Historical and Natural History Society of Colorado in 1921 and 1922, excavating the Chimney Rock ruin at the Piedra Parada on the Piedra River, with Frank H. H. Roberts, Jr., as his assistant. In 1923 Roberts made a thorough reconnaissance of the Piedra Valley from the vicinity of Chimney Rock to the San Juan. Unpublished minor work was done by the Society in 1924 and 1925. In 1928 Roberts, having worked with Judd at Chaco Canyon in the interim, returned to the Piedra for the Bureau of American Ethnology and excavated small Pueblo I sites on Stollsteimer Mesa (Jeancon 1922; Jeancon and Roberts 1923; Roberts 1925 and 1930).

In 1927-1929, six small sites in the Ackmen-Lowry district of the Hovenweep drainage, fifty miles north of Mancos Canyon, were excavated for the State Historical Society by Paul S. Martin (Martin 1929, 1930, and Martin 1939, 474-80). Martin excavated Lowry Pueblo in 1930-34 (Martin 1936) and small early sites nearby in the seasons of 1937 and 1938 (Martin 1938, 1939).

No excavation or systematic archeological survey in Mancos Canyon is on record; and no reconnaissance after the rapid visits by Jackson and Holmes in 1874 and 1875 except an inspection by Fewkes in 1918 (Fewkes 1918, 58-59).

The Project and Procedure

In April, May, and June, 1942, salvage excavations were performed, under permit from the Secretary of the Interior, at five ruins damaged by road construction in lower Mancos Canyon, on the Ute Indian Reservation just south of the Mesa Verde, in Montezuma County, southwestern Colorado. Twenty-four other open sites in the same section of Mancos Canyon were surveyed, and sherd collections from most of them deposited at the Laboratory of Anthropology in Santa Fe. Cliff dwellings and open sites in side canyons and on the mesas were not included.



Fig. 3. Site 11 before excavation.



Fig. 4. Excavation in progress at Site 1.

Sites excavated

Site 1, in the NE 1/4 Sec 35 T33N R17W, N.M.P.M., Montezuma County, Colorado, is located on the Mancos River Road 4.7 miles in (east, up-stream) from Highway U.S. 666. A small unit-type pueblo, Site 1 covers a low, small hill in the flat north side of the valley. The road crosses between the pueblo and the refuse mound, so that relatively little damage had been inflicted. The northern part of the refuse had been disturbed. Excavations were carried on at Site 1 with a crew of six CCC-ID laborers, Navajos and Utes, for six days in early April, plus a small amount of additional work later, making a total of 42 man-days.

The refuse was trenched; the partitions between trenches were then taken down in five inch levels to get a general stratigraphic picture; finally a detailed stratigraphic test in three inch levels was carried out on a block five feet square near the center of the mound. Refuse adjacent to and under the road was left unexcavated. Concurrently, sufficient work was done in the pueblo to obtain an idea of the nature of the structure. It was felt that this work, though just off the road line, was justifiable under the permit in order to determine the sort of architecture associated with the material found in the refuse, even salvage excavation being, after all, intended for and justified only by scientific objectives. Most of the little pueblo remains unexcavated.

The excavated portion of the refuse mound, being on the proposed line of the new road, was left to be bulldozed off or backfilled according to construction needs. The excavated rooms of the pueblo were left largely open; trenches and deep features were backfilled.

The second site crossed by the road, and consequently excavated in this project, Site 3, is in the NW 1/4 Sec 31 T33N R16W, 1.6 miles above Site 1 and 6.3 miles from the highway. No noticeable harm had been done here, but the line of the proposed road relocation crosses what was thought to be a refuse area. Excavations were performed here on April 15, 16, and 17, with additional work later, making a total of 28 man-days. The site consisted of a very small ruin mound just south of the proposed road line, a circular depression adjoining it on the south, and refuse accumulation beyond this. Indications of occupation were also observable to the north of the present road. More or less concurrently, the refuse area to the south was trenched and then more extensively dug over, the little pueblo excavated and the depression trenched, a series of trenches carried through the area of the proposed road, and two structures north of the road cleared.

Two separate occupations or components were found at Site 3, one antedating and one postdating Site 1 in type. The late component includes the pueblo ruin (a very small hamlet of three rooms virtually at present surface), a large kiva in the depression, and the thin refuse accumulation to the south. The early occupation is represented by the two slab cists north of the road, by stray sherds of pottery (including

one restorable specimen) in the area crossed by the proposed road location, and by a deep pit room in the depression, cut by the south recess of the later kiva. Surprisingly little mixture of sherds between the two components has occurred.

Site 4 is only about half a mile above Site 3 and is 6.7 miles from the highway. It is in the N 1/2 Sec 31 T33N R16W. A small masonry pueblo, larger than Site 1 and better preserved, Site 4 furnishes a good example of the classical unit-type. The refuse mound had been totally destroyed by the Mancos River road. Tests were put down on either side of the road to determine whether any refuse deposit had survived. None had. The structure nevertheless proved sufficiently interesting that its excavation was prosecuted to virtual completion, despite the lack of burials and stratigraphy. Site 4 was dug in May, with an expenditure of 67 man-days. One room in the center of the ruin mound was left unexcavated, four rooms were merely outlined by trenching inside the walls. Ten rooms and the kiva were completely excavated; the exterior wall was outlined and an outdoor fireplace found.

Site 7, located 8.7 miles up from the highway, in Sec 33 T33N R16W, had been so badly torn up by road construction as to appear hardly worth working. A few days' work, however, yielded much more data and material than expected, and 23 man-days were expended at Site 7 in late May. An old road passed the south edge of the refuse mound and had done very little damage; the road constructed in 1936 and in use in 1940 had destroyed half the pueblo and part of the refuse, and virtually entirely removed a structure of Pueblo I type. The older road has been in use since 1940, and the new road is to go between the two, right across the refuse mound. Between June 1940 and April 1942 a bulldozer was turned around on the refuse mound, damaging the middle section of it.

The surviving half of the small building was excavated, one of the four rooms being only outlined by trenching, and the refuse mound was extensively trenched. Tests along the surviving 40 foot remnant of the back wall of the Pueblo I-type structure demonstrated that nothing else remained of this component.

Site 11 is an extensive area of prehistoric occupation on a high irregularly gullied slope on the south side of the mouth of Ute Canyon, 11.7 miles in from the highway. It is in the SE 1/4 of NE 1/4 Sec 35 T33N R16W. The old road had done no damage. The new road line crosses the site, and excavations here were planned during the inspection by Indian Service and National Park Service officials on June 19, 1940. Construction of a bridge across Ute Canyon in 1941 involved the bulldozing off, on the new road line, of over half of the Site 11 refuse mound to provide fill for the west approach of the bridge. Excavations in the remainder of the refuse--the bottom and the west and north edges of the mound--were performed on May 27 and June 8 and 9, totaling 14 man-days. Three burials, 28 specimens, and quantities of sherds were recovered.

Sherds were collected separately from the surface of the bulldozer swath, from the bridge approach and other dirt piles representing the bulldozed-off top half

of the mound, and the eastern part of the occupation area north of the road line, where structures of Pueblo I type had been largely removed by gully erosion. No sherds could be found on the indicated structure just north of the refuse, a pair of depressions 50 feet apart with no observable surface building associated. These were not excavated, but are thought to be masonry kivas, belonging with the latest pottery in the upper part of the refuse, rather than Pueblo I pit houses.

The data and material recovered from these sites are presented in the following chapters of this paper: summaries by site first, then detailed treatment of architectural features and of several categories of minor objects of material culture. The final section discusses sequence and chronology and general placement in Southwestern prehistory. Reports by specialists are appended.

CHAPTER II

SYNOPSES

Site 1 (LA 2390)*

Small unit-type pueblo kiva (evidently of Mesa Verde type) and perhaps twelve rooms (compare Prudden 1903, Fig. 6), on a low hill; refuse on the south slope of the little rise. Three rooms and two associated rectangular slab-lined vaults excavated, kiva located (east pilaster cleared to bench), refuse mound excavated. Four burials found in refuse, disturbed and fragmentary infants, brachycephaly and lambdoid deformation indicated. No intramural burials.

Physiographic situation

Site 1 proved far smaller than it appeared at first inspection. The supposed ruin was found at once to be a natural hillock with a rather thin covering of archeological remains. It rises 10 ft. above the surrounding flats at its higher northern end. A small pueblo structure was built on this upper portion of the hill, the middle slope was utilized as a plaza in which a kiva was sunk, and refuse was thrown out on the southern toe of the hill, building up to a depth of 30 in. at the center, now rising 2 ft. above the immediately surrounding flat. The area and the site have been eroded rather than filled over by deposition; the ground level has changed very little since the period of occupation. Horizontal erosion has not been very important in Mancos Canyon, however, and Site 1 has not been reached by the vertical erosion (arroyo channeling) discussed elsewhere in this report.

Pottery

Generally Pueblo II; black-on-white and gray corrugated, San Juan Orange Ware and miscellaneous intrusives. Overwhelming predominance of Mancos Black-on-white (nearly 3,000 sherds, and Specimens 1/3, 1/25, 1/26), largely well developed and typologically late (and largely actually McElmo Black-on-white according to Gila Pueblo); and of variable indented corrugated (about 2,600 sherds and Jar 1/20).

Earlier types: corrugated-neck and banded-necks, 14 definite of each; 500 plain gray jar sherds, of which many are undoubtedly from coil-neck pitchers, but seven rims and a number of neck sherds definitely of plain vessels; 12 sherds of the corresponding Pueblo I decorated, Piedra Black-on-white; 11 of La Plata Black-on-white (iron paint, or eastern, Basket Maker III).

Later types: a small amount, about 50 sherds, of McElmo Black-on-white (see the discussion of this problematical type below), not true classic Mesa Verde. The variable indented-corrugated included material approaching the standardized styles of later corrugated ware.

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* The numbers in parentheses are the site designations assigned to sherd collections deposited at the Laboratory of Anthropology, Santa Fe.

Intrusives

Chaco 3 Black-on-white, three sherds of one pitcher.
(Chaco 2 possibly represented, hard to separate from Mancos.)
Rosa Black-on-gray, one typical (a few of the Piedra are similar).
Red Mesa Black-on-white, one fairly definite.
Sosi Black-on-white, one sherd.
Wingate Black-on-red, ten sherds of four to six vessels.
Unnamed polished brown corrugated affinis (that is, very similar to but not identical with) Showlow series.
Clear Creek (?) Brown, six sherds of one bowl.
Abajo Red-on-orange, six sherds.
La Plata Black-on-orange, normal (no slip, rock temper), ten; undecorated orange sherds, unslipped and rock-tempered, six; La Plata Black-on-orange, exterior red-slipped, one.
La Plata-Bluff (?) Black-on-red (thin slip, rock temper), six; Bluff affinis Deadmans Black-on-red (same, well finished, advanced designs), ten.
Tusayan Black-on-red, six sherds and Specimen 1/18.
Citadel Polychrome, three sherds.

Stratigraphy

In the 3 in. stratigraphic test, so-called McElmo Black-on-white is restricted to the uppermost four layers, while Mancos and indented-corrugated predominate throughout, standardized styles of the corrugated being more common in the upper half. Coil necks and plain gray are irregularly distributed just as sparse in the lower layers as in the upper. La Plata and Piedra Black-on-white occur only below the uppermost four layers. The so-called McElmo is more abundant in the rooms than in the refuse, exceeding Mancos Black-on-white in Rooms D and E, but the utility ware from the pueblo is as variable as that from the refuse, including plain gray and banded-necks.

The latest intrusives are Citadel Polychrome, Chaco 3, and Sosi Black-on-white--all of the first half of the twelfth century. One small sherd of Citadel came from the top 3 in. of the refuse, another from the surface. The Chaco 3 sherds similarly were on and near the surface. The Sosi sherd and a large Citadel sherd are unplaced. The sherds of Wingate Black-on-red and of types of San Juan Orange Ware earlier than Citadel Polychrome occurred in the pueblo, on the surface, and in the refuse; the earliest, Abajo, being hardly less sparse in the bottom of the refuse than in the top, and Wingate and Tusayan Black-on-red being found deep in the refuse as well as high.

Period

Evidently, the site is essentially pure Pueblo II, of the Mancos phase or focus, but was occupied into the beginning of the so-called McElmo development toward classic Mesa Verde Black-on-white. Standardization of the corrugated ware evidently got under way at about the time of McElmo Black-on-white. Three intrusives show twelth century occupation. (Three tree-ring dates obtained by E. T. Hall, Jr., from Room H, Site 1, have been confirmed in 1950 by T. L. Smiley and may now be

utilized in study and discussion of the site. Although all are dates plus an unknown constant, they fall very close together and may be taken as representing A. D. 1195 or 1200, indicating occupation here later than suggested above.) The various Basket Maker III-Pueblo I types, local and intrusive (La Plata, Rosa, and Piedra Black-on-white; plain gray and coil-necks; Abajo Red-on-orange, La Plata Black-on-orange, Bluff Black-on-red) presumably are holdovers from pottery made before Site 1 was built.

Bone implements

Splinter awls (two complete), short stubby awls with unmodified epiphysis (two complete), a bodkin or perforated weaving tool, a bone tube, a shaft fragment with perforation (possibly representing a musical instrument).

Stone implements

Scoop metates, and manos of oval, rectangular, and triangular section; floor-polishers; crude notched-pebble axes and hoes, and a full grooved hammer; crude scrapers and choppers; a sandal form.

Ornaments

Red stone disc pendants, a shell bracelet fragment.

Site 3 (LA 2386)

Two components, distinguished by architecture and associated pottery; Basket Maker III semisubterranean structures, and a tiny Mesa Verde unit pueblo with a Mesa Verde kiva of normal size.

The three rooms of the pueblo cleared, the south recess of the kiva excavated and the northwest pilaster located, the thin Mesa Verde refuse accumulation excavated. No burials in the late component, few specimens (bone tubes, chamahias).

In the early component, two slab-lined round storage chambers and a pit room (cut by the south recess of the kiva) excavated; one burial in a pit in the floor of a storage cist (undeformed dolichocephal, semiflexed on side, no offerings); a few specimens (tubular pipe of brown pottery; manos, scrapers, and choppers, and miscellaneous pebbles).

Physiographic situation

In contrast to the preceding site, Site 3 was out in the open flat on a very gradual slope to the river terrace. The ground surface was clearly about the same as at present at the time of the later occupation, about seven hundred years ago. Another six or seven hundred years earlier, at the time of the previous occupation, the ground level was exactly that of today at the north end of the site, but may have been decidedly lower 183 ft. to the south where the deep pit room was found with the top of its wall 2 ft. 5 in. below present surface. The accumulation over the pit room could have been formed largely by dirt excavated in building the later kiva. Natural deposition might also have occurred between the sixth century and the

thirteenth. Only very little horizontal erosion has taken place since the thirteenth century.

Pottery

A. Pueblo and refuse: Mesa Verde Black-on-white and standardized corrugated. Very crude Mancos style designs on otherwise fully advanced Mesa Verde Black-on-white, and well developed classic of both major decorative styles. Twenty-two plain gray sherds presumably strays from the other component; 15 sherds of Mancos Black-on-white, including 5 of early style resembling Piedra. No intrusives.

B. Pit room F: La Plata Black-on-white (4 sherds) and plain gray (42); one sherd of polished unslipped rock-tempered orange ware of the Alkali series. One sherd of Mesa Verde Black-on-white near the floor in the southwest corner, presumably rodent-transported from the ventilator of the kiva 6 ft. north.

C. Slab storage cists: La Plata Black-on-white, plain gray (including fugitive red), a little affinis Rosa Gray. A few sherds of four La Plata bowls at one structure, of two at the other; abundance of plain gray, including restorable Jar 3/6. Some of the plain gray is very crude, some is partly polished. No intrusives.

D. Area between cists and pueblo: a La Plata Black-on-white bowl (Specimen 3/4), 30 sherds of plain gray, 6 corrugated sherds, and 10 white ware.

Stratigraphy

The kiva of the Mesa Verde settlement evidently destroyed a Basket Maker III pit house; the south recess and ventilator cut through an earlier structure, containing La Plata pottery, which I take to be merely an antechamber. No stratigraphic work was possible within either component, each a pure site probably of short occupation. No intrusives except the single sherd of undecorated orange from the La Plata component.

Site 4 (LA 2387)

Unit-type pueblo, on the end of a low ridge, 15 rooms and a kiva of Mesa Verde type (six -pilaster, large south recess) 13 ft. in diameter at the floor. The refuse mound had been destroyed by road construction. The kiva and 14 rooms (4 incompletely) excavated. Complicated arrangements of grinding-bins and small basins in the floors of two rooms. An outdoor fireplace filled with white ash. No burials found.

Physiographic situation

The pueblo is situated on a little hill forming the end of a low ridge extending out from the cliff. Collapse of upper walls had formed a ruin mound consisting

largely of rocks and protected by a thick growth of grass. Erosion had destroyed only the south edges of south rooms extending into the depression formed by the collapse of the roof of the deep kiva. Soil had accumulated against the north and east sides of the building, old ground level being buried 10 in. at the northeast corner. Refuse evidently had been thrown down the south slope of the hill.

Pottery

Mesa Verde and Mancos Black-on-white, indented-corrugated. Predominance of Mesa Verde. Two sherds of Piedra Black-on-white, two corrugated-necks, two banded necks; thirty rough gray and polished plain gray sherds like the Site 3 (early occupation) material. One pitcher rim of Chaco 2 Black-on-white from the bottom of the kiva (associated local pottery: developed Mesa Verde); one sherd of La Plata -bluff (?) Black-on-red, and one of Tusayan Black-on-red, from the floor of Room E (association: developed Mesa Verde); one of undecorated red, probably Bluff, from Room M.

Stratigraphy

No significant findings. (A tree-ring date of 993+x obtained by T. L. Smiley from a fragment of pinyon charcoal associated with a corrugated jar set into a room floor here cannot be used to advantage as the x is believed by Smiley to be quite large.) North and east Rooms (K, L, M, N, P, Q) possibly disused early, as they yield more Mancos Black-on-white than Mesa Verde, more variable corrugated. Stratigraphy in kiva fill inconclusive; more Mancos in top than in bottom.

Bone implements

Three splinter awls, a stubby awl with split epiphysis, a needle or bodkin, three bone tubes.

Stone implements

Flat, thick, heavy, slab metates, and a fragment of a scoop metate; manos of rectangular and triangular section; floor polishers; crude notched-pebble axes and relatively well made full-grooved axes; hammerstones; a pair of crude arrowshaft-smoothers.

Ornaments

Tiny disc beads, four of white stone and one of turquoise.

Site 7 (LA 2388)

A small pueblo, half-destroyed by the road, and a damaged refuse mound. (Also, a Pueblo I sherd area adjoining, structure destroyed, presumably a crescentic house-row.) A single row of four large rectangular rooms, one of them containing a four-pilaster intramural kiva. Subterranean kiva not located. Noteworthy amounts of selenite and turkey bones in kiva fill. Four intramural infant burials without offerings, one of them in a floor pit. Five refuse burials--two adult, each with a small Mancos Black-on-white bowl; three infants, covered with large sherds of pottery. Semi-

flexed position and lambdoidally-deformed brachycephaly indicated.

The site is on fairly level ground, close to the cliff in a narrower stretch of the canyon. Soil had accumulated against the north wall. The ruin mound was covered by relatively thick vegetation, including small juniper trees.

Pottery

A. From the east structure, or Pueblo I sherd area: Piedra Black-on-white, banded-necks and plain gray.

B. From the refuse mound: Mancos Black-on-white, much of it early in style, some Piedra; variable corrugated, some plain gray and coil-necks.

C. From the pueblo rooms: Mancos Black-on-white; one large sherd of McElmo-style Mesa Verde Black-on-white found on the bench of the kiva, and a number of Mesa Verde sherds in the soil piled up against the north wall outside the building. Utility ware variable-corrugated, nine sherds of plain gray (at least one probably of coil-neck vessel). One sherd of La Plata Black-on-white (Basket Maker III) from a floor pit in Room B which also yielded one plain gray, one indeterminate orange, and one fully developed Mancos Black-on-white.

D. Intrusives from entire site: a dozen black-on-red (andesite-tempered slipped orange ware), ranging from early-style Bluff (?) or La Plata with thin brown manganese paint on pink or light brown surface, wide spiral designs, poorly finished but thinly slipped, rock-or rock-and-sherd-tempered, to exceptionally well finished "Bluff affinis Deadmans" with dense black paint on a good red slip, but andesite temper. (See discussion of Bluff-Deadmans Black-on-red, below.) A worked sherd, possibly Tusayan Black-on-red.

Stratigraphy

None definable in refuse. Evidently the pueblo was built during Mancos times, replacing an adjacent Pueblo I structure; evidently occupation continued to Mesa Verde times, but with refuse not thrown out on the mound during this final phase.

Bone implements

Two fine large awls or daggers and a chisel from the kiva; a splinter awl and a fragment of a rib awl from the refuse.

Stone implements

A mano of flat-oval section from the Pueblo I area; a crude notched-pebble axe from the kiva; scoop metates and 14 manos of various types; hammerstones, a chopper, a chert scraper.

Site 11 (LA 2389)

Two circular depressions, unexcavated, 50 ft. apart, 30 and 35 ft. in diameter; no pueblo associated but evidently masonry kivas (belonging with Mesa Verde pottery in the top of the refuse) rather than early pit houses; a heap of fallen rock on the east side of the eastern pit may represent a kiva tower.

Three burials in or under refuse: two adults, semiflexed on back; and one infant, extended on back, at depth 6 ft. (in caliche); all accompanied by Pueblo I pottery (Rosa or Piedra); lambdoid deformation.

Pottery

Mesa Verde, Mancos, Piedra Black-on-white, a little La Plata Black-on-white; indented-corrugated, banded-necks, plain gray. Some Rosa Gray Ware, black-on-gray and smoothed; several Rosa coil-necks, wide flat-banded and tooled-coil. San Juan Orange Ware: Abajo, 6 sherds; La Plata, 30, plus subtype (?) with dense black paint on bright orange, 2; unslipped orange sherds lacking decoration, 14; Bluff (?)-Black-on-red, 11; plus four thinly red-slipped but lacking decoration.

Stratigraphy

Main east-west trench along surviving north face: Upper cuts: Mesa Verde Black-on-white, Mancos of all styles, indented-corrugated, Bluff Black-on-red, and Pueblo I material as in next. Deeper levels: Piedra Black-on-white, banded-necks and plain gray, Rosa Gray Ware; La Plata Black-on-orange, a little Abajo Red-on-orange. Deepest cut: plain gray, Abajo Red-on-orange, one sherd of La Plata Black-on-orange, one of Black-on-white with fugitive red exterior.

North-south trench at west end of mound: Top 6 in.: Mesa Verde Black-on-white, coil-necks and corrugated. Six in. to 1 ft.: Mesa Verde, Mancos, and Piedra Black-on-white; coil-necks and plain gray, a little corrugated, La Plata Black-on-orange. One ft. to 2 ft.: Piedra Black-on-white, coil-necks and plain gray, a little Bluff Black-on-red.

Bone implements

A splinter awl, and two bird-bone awls with unmodified epiphysis; a stubby awl or bodkin with split epiphysis, perforated near the end; a bone tube and the end of a turkey tibia from which tubes were cut. The splinter awl and the perforated awl are of definite Pueblo I association; the others are from mixed cuts.

Stone implements

Fragments of three thin flat scoop metates of definite Pueblo I association; four rough choppers and three crude axes (one incomplete), from Pueblo I, and mixed cuts.

Shell ornament

One bracelet fragment, from a trench in Pueblo I refuse.

Survey of Unexcavated Sites

In connection with the excavation program, all additional sites observed on the floor of the valley in the lower course of the canyon were listed and surveyed (in the sense of archeological survey, not in that of accurate mapping). A fairly thorough collection of surface potsherds was gathered at each small site yielding few sherds; samples from larger sites with abundant sherds were selected to include the predominant types and the variations and intrusives. From six sites collections were not retained. Brief notes and roughly measured sketch plans were made.

Twenty-four sites on the canyon floor were located in addition to the five at which excavations were conducted. All sites found by me are on the north side of the river. All are on the second terrace, two of them at the edge of the terrace and partially eroded. Any pure Basket Maker III sherd areas were missed; and only three Pueblo I sherd areas were found, all of them close to the large late Pueblo #18, the westernmost site in the canyon. One of the Pueblo I sites is virtually within Site 18, adjoining the refuse mound of the pueblo. Probably there are many other early sites in the canyon lacking surface indications of structures and hence inconspicuous and overlooked. In addition to Pueblo I components at Sites 7 and 11, Basket Maker III and Pueblo I sherds occur at many of the Mancos and Mesa Verde sites.

Seven sites characterized by predominance of Mancos Black-on-white are unit-type pueblos; another at the edge of the second terrace, had been almost entirely removed by erosion, and the sort of building could not be determined. Twelve sites yielding Mesa Verde Black-on-white, purely or predominantly, included two fairly large pueblos comparable to Lowry Ruin, with intramural second-story kivas and associated large kivas indicated, both with Mancos as well as Mesa Verde pottery; six small unit-type buildings, two of them with Mancos Black-on-white also present in less quantity, one with a Basket Maker III component indicated by a large percentage of plain gray sherds; four double-unit or twin-kiva pueblos (see discussion below), pure Mesa Verde so far as shown by surface sherds, three of them with the pueblo itself very small and with indications of kiva towers.

The following tabulation includes all sites found in Mancos Canyon below the mouth of Johnson Canyon.

Site 1	(excavated)	unit type, Mancos.
2	(LA 2368)	large unit type predominantly Mancos, a little Mesa Verde, a little Piedra, one sherd of Bluff Black-on-red.
3	(excavated)	slab-walled pits with La Plata pottery; small unit, Mesa Verde.
4	(excavated)	unit type, Mancos and predominant Mesa Verde.

5 (LA 2377) twin kivas with very small pueblo unit, probably with tower, Mesa Verde.

6 (LA 2366) evidently a unit type (largely bulldozed off the road), Mesa Verde.

7 (excavated) small unit with intramural kiva, Mancos; adjoining Piedra site.

8 (LA 2378) structure eroded at edge of terrace, Mancos with one undecorated sherd of unslipped San Juan Orange Ware.

9 (LA 2367) twin kivas with small unit, probably with tower, a few so-called McElmo sherds.

10 (completely removed by road construction; no collection).

11 (excavated) twin kivas and eroded remnants of Piedra-focus structures; La Plata to Mesa Verde.

12 (no coll.) unit type, Mesa Verde.

13 (no coll.) unit type, no sherds.

14 (no coll.) unit type, Mesa Verde.

15 (LA 2375) large pueblo, preponderantly Mesa Verde, also Mancos Black-on-white and plain gray (probably from coil-neck vessels).

16 (LA 2376) fairly large unit type on talus slope, Mancos; double-walled tower associated.

17 (LA 2371) small unit type, Mancos and a little Piedra (see below).

18 (LA 2363) large pueblo with 50 ft. kiva, Mancos and Mesa Verde (see below).

19 (LA 2374) probably small unit type, badly eroded; predominantly Mancos, a few Mesa Verde sherds and plain gray (strays from higher sites nearby).

20 (LA 2365) unit type, Mesa Verde plus a little Mancos and plain gray.

21 (LA 2373) unit type, Mancos plus a possible Pueblo I component (60 each of Mancos Black-on-white and corrugated: 16 Piedra Black-on-white, 2 La Plata Black-on-white, 6 plain gray, 1 undecorated orange).

22 (LA 2364) Pueblo I sherd area (intrusives: 1 Abajo Red-on-orange, 10 La Plata Black-on-orange, 6 undecorated orange).

23 (no coll.) Pueblo I sherd area.

24 (LA 2361) Pueblo I sherd area (intrusives: 1 La Plata Black-on-orange, 6 Bluff Black-on-red, 3 undecorated orange; 1 Wingate Black-on-red which may be drift from the adjoining Site 18.)

25 (LA 2369) small unit on little hill, Mesa Verde and Basket Maker III.

26 (LA 2372) small unit, Mancos.

27 (no coll.) small unit, near a single-walled tower, Mancos.

28 (no coll.) double unit, Mesa Verde.

29 (LA 2362) unit, with kiva tower, Mesa Verde.

30 (LA 2370) double unit, probably with kiva tower, Mesa Verde, plus a little Mancos (25 Mesa Verde Black-on-white, 8 Mancos Black-on-white, 11 corrugated, banded-neck, 3 plain gray).

Site 18 is a large pueblo in the mouth of the canyon, the westernmost site located, close to which are three Pueblo I sherd areas, one of them adjoining the refuse mound of the pueblo. Sherds were collected separately from refuse and pueblo at Site 18 and comprise the following:

	Building	Refuse Mound
Mesa Verde Black-on-white	42	20
Mancos Black-on-white	9	18
Indented-corrugated	23	only rims collected:6
La Plata Black-on-white		1
Bluff Black-on-red	1	1
Undecorated orange	1	
Wingate Black-on-red		2
Puerco Black-on-red		1
Querino Polychrome	1	

Site 17 is a small unit about 500 feet from Site 1, with structures eroded and inconspicuous, and the refuse mound on the edge of the terrace and cut by erosion. A number of intrusives and Pueblo I sherds were found, and a test was dug to the bottom of the mound; single focus occupation seems indicated.

	General (saved)	Bottom 4 inches
Mancos Black-on-white	50	6
Indented-corrugated (variable, including several clapboard style, probably from coil-necks)	11	6
Banded-necks	1	1
Piedra Black-on-white	6	2
Plain gray (neck sherd) incised (trailed) gray with lugs	1	1
Abajo Red-on-orange	4	
La Plata Black-on-orange	4	
Bluff Black-on-red	3	1
Tusayan Black-on-red	1	
Undecorated orange ware	2	

The few intrusives found at other sites are mentioned in the list of sites.

Distribution of Sites

Sites extend downstream to just within the mouth of the canyon; there seem to be none whatever for some little distance west of Site 18. Any that are present out in the open flats and were overlooked must be small and inconspicuous. There are little cave rooms in shale, and towers on the rim above them, on the Mancos several miles further down toward the San Juan (Holmes 1878, 390, Pl. XXXII; Fewkes 1919, 59-60, Pl. 30 b, Pl. 31). I did not visit these. Out in the broad and barren Montezuma Valley, between the Mesa Verde and the Ute Mountain range, which the Mancos traverses between Site 18 and the ruins just referred to, sites seem to be lacking from the Mancos north for 15 miles, and probably similarly absent on the south, between the Mancos and the San Juan at Shiprock. This absence of prehistoric

occupation is paralleled by present conditions, and may be ascribed to the fact that the valley is underlain by the impervious Mancos shale.

Within the canyon the shale is covered by alluvium, and the cliffs are formed by the Mesa Verde sandstone, a good aquifer. As soon as the cliffs recede, the shale crops out and the land is barren. The Mancos shale evidently will not support agriculture (or any wild vegetation but the sparsest and hardiest), and remains of sedentary people are found on it only in such spots as the canyon of the Mancos River where it is overlain by thick alluvium; the sandstone cliffs are close, and a good stream flows fairly continuously. Cessation of Pueblo sites at the outcropping of the Mancos shale is a phenomenon noted elsewhere, as in the Manuelito Valley, for example.

In prehistoric times, as is virtually the case today, there evidently was no permanent occupation of the Montezuma Valley south of the Ute Reservation line (Towaoc gets its water from the mountain by means not available to the Anasazi). Only a few miles north of the line there is irrigated farming at present; prehistoric sites are still rare. An unexplained excellent water supply at Aztec Springs (Yucca House National Monument) furnishes water for this section of the valley. The Anasazi utilized it only in the immediate vicinity of the spring, as evidenced by the immense concentration of Mesa Verde population (perhaps with earlier occupations) signified by the Yucca House ruins, and the small sites for half a mile or so to the west and south.

In the McElmo-Hovenweep drainage adjacent to the north, draining west from the upper end of the Montezuma Valley east of Cortez and southwest from Ackmen and Dove Creek, ruins are abundant in the dissected Dakota and Morrison sandstone mesas and canyons. The profusion of ruins in the plateaus of Mesa Verde sandstone on either side of the Mancos is well known.

The canyon of the Mancos, though the stream is dignified with the name of river and drains the surrounding uplands, is not a barrier or boundary of any sort, but simply the deepest of the fairly large canyons dissecting the Mesa Verde and adjacent plateaus. It forms a narrow valley between steep sandstone cliffs. The surrounding landscape has probably changed only in details during the past two thousand years; and an Upper Sonoran type of biotic community, as at present, is indicated for the period of prehistoric occupation.

Artifacts

A list of specimens catalogued is presented in Appendix I. These are discussed in detail in the following chapters.

Missing Artifact Types

All sites worked in Mancos Canyon were small pueblos in the open, so that only objects of relatively imperishable material (such as pottery, stone, bone) had survived.

No remnants were found of artifacts of vegetal and animal material such as are recovered from sites in dry caves and from inner rooms of great kivos--bows and arrows, axe helves, digging sticks and ceremonial wands, fire drills and other wooden objects; baskets, matting, pot rests, cordage, cotton cloth, skins, feathers, fur, sandals and snowshoes, etc. The only organic material surviving is bone. Coiled basketry is evidenced by imprints on pottery (compare O'Bryan 1950, 82).

The various types of pottery found in the southwestern Colorado area are all represented by at least a few sherds, except some of the less common so-called intrusives. The following do not appear in the Mancos Canyon excavation material: San Francisco Red; brown ware, smooth or corrugated, with smudged black interior; Abajo Polychrome; Tusayan Polychrome; St. Johns Polychrome, Houck Polychrome, and Klagetoh Polychrome; Red Mesa Black-on-white; Kana-a Black-on-white, Black Mesa Black-on-white, Tusayan or Flagstaff Black-on-white.

Many minor variations of local pottery types are not represented in the small amount of material, particularly the unusual and eccentric shapes which occur, especially in the painted ware, in large collections such as that from the district adjacent on the east, the Johnson Canyon and La Plata drainages (Morris 1939). Half-elbow or slanting-bowl clay pipes (Fewkes 1923, Fig. 93; Jeancon 1922, Pl. XXIII; Martin 1936, Fig. 15; Morris 1919, 26; Morris 1939, Pl. 231a), and perforated worked sherds (Martin 1936, Fig. 14: a, o; Morris 1939, Pl. 173: J; Gillin 1941, Pl. VII: B: 10,11) were not found (neither item is mentioned for Mesa Verde sites in O'Bryan 1950).

In the bonework, the most notable absence is the humerus scraper. This implement is characteristic of the final phase of San Juan Anasazi in Pueblo III (Nordenskiold 1893, Pl. XLI: 1, 2, 4, 5; Fewkes 1909, 49; Martin 1936, Fig. 23; Brand et al. 1937, 94 and Pl. XVIII: b; Whittemore in Kluckhohn and Reiter 1939, 137-138, 145; Morris 1919, 36-37; Morris 1939, 121, Pl. 110; Beals, Brainerd and Smith 1945; Balcony House, Mesa Verde--unpublished excavations of J. L. Nusbaum 1911: photographs of artifacts seen in 1946; Brew 1946, 242; O'Bryan 1950, Pl. XXXVII-c). A similar tool, using metatarsus instead of humerus, occurs a little later in the Rio Grande culture area at Pecos (Kidder 1932, 323). In western Pueblo sites the humerus scraper is apparently less common, although it was found at Kinishba (Baldwin 1939, 319). Absence of the humerus scraper in the Mimbres has been noted (Cosgrove 1932, 62). The earliest recorded occurrence of the humerus scraper is one found in site Wingate:11:60, of the Red Mesa phase, about A. D. 870-930 in the upper drainage of the Puerco River, in western New Mexico east of Gallup (Gladwin 1945, 58). The three humerus scrapers from Alkali Ridge all come from sites of the Mancos period, the tenth and eleventh centuries (Brew 1946, Fig. 186). Nor do I have any of the earlier type of similar implement, the less standardized so-called endscrapers or fleshers of Pueblo I (Martin 1938, 256, 267; 1939, 424-425; Morris 1939, 122, Pl. 111; Brew 1946, 242, Fig. 185).

Also lacking are rabbit tibia or fox tibia whistles (Martin 1939, 424-425; Roberts 1930, 147), antler chisels and flakers (Roberts 1930, Pl. 42; possibly Martin 1936, Fig. 25; Morris 1939, Pl. 113; O'Bryan 1950, 88), scapula scrapers (Morris 1939, Pl. 111), deer ulna weaving tools (Morris 1939, Pl. 108; compare Kidder 1932, 226-227), polishers (Martin 1936, Fig. 22: b; Morris 1939, Pl. 109: 1-q), bone dice or counters (Roberts 1930, 147; Morris 1939, 123; Martin 1939, 420-421), and minor types of uncertain purpose (Martin 1939, Fig. 22: c-f; Morris 1939, Pl. 109: a-k). Larger series, such as those referred to in the citations, also include a wider variety of awls.

A conspicuous lack in the stonework collected is the absence of flaked points or blades such as arrowpoints, lanceheads, knives and large blades, drills. The only chipped stone objects found are a few coarse scrapers.

Among pecked or ground stone implements and utilized stones, the following are missing which are known from Morris' work to the east: pitted rubbing stones, so-called corn-goddess symbols (compare Fewkes 1917a, 481; O'Bryan 1950, 85), so-called altar stones, paint mortars, paint cylinders, mortars (compare Nordenskiold 1893, Pl. XXXVIII: 3, 4, Figs. 61, 62; Morris 1919, 28-29; Woodbury in Kluckhohn and Reiter 1939, Map p. 75), globuloid mauls (compare Nordenskiold 1893, Pl. XXXIX: 2; Roberts 1930, Pl. 45; O'Bryan 1950, Pl. XXXIII-c), lignite pendants, shale beads. The following additional types, reported from neither the Mancos drainage nor the La Plata drainage, were found by Martin at Lowry Pueblo, mainly in Mancos Black-on-white associations: shouldered thin slab of tuff, small zoömorphic felsite pendant, small felsite tablet, small trachyte ring, small polished limestone hemisphere, so-called buttons of sandstone, so-called medicine cylinders. The absence in the Mancos Canyon material of additional types of stone ornaments from earlier sites, in the Lowry district and on the Piedra (Martin 1939, Fig. 119; Roberts 1930, Pl. 53), is not surprising with the small amount of work done in Pueblo I remains.

No shell work except two fragments of simple Glycimeris bracelets were found: no curved shell pendants (Morris 1939, Pl. 176), no Oliva and Olivella shell beads (for example O'Bryan 1950, 88), no Haliotis pendants, nor shell disc beads (Morris 1939, Pl. 177; Martin 1939, Fig. 120: c,f).

Architectural features lacking in structures excavated include, notably, kiva murals, masonry deflectors, definite indoor firepits (except in kivas), masonry storage pits within room, evidence of doorways or windows in rooms.

No Pueblo I structures were included in the excavations, and very few Basket Maker III. No burials definitely assignable to the Mesa Verde period were found.

CHAPTER III

ARCHITECTURE

Site 4

Site 4 is treated first under this head because it is of fairly normal type, and the kiva and most of the rooms were fully excavated. The pueblo is a compact block of 15 rooms, 12 of them normal oblongs 5 ft. by 7 ft. to 7 ft. by 9 ft. in size (see Fig. 5). The southeast room is abnormally long, 14 ft. plus (south wall, if any, eroded away), but 7 ft. 4 in. wide. The northwest corner of the building consists of a pair of long narrow rooms or corridors, 3 ft. 10 in. and 3 ft. 4 in. wide, approximately 21 ft. long, the west ends apparently open. The five central rooms (ABCDI) may have been two storied, judging from the amount of fallen rock in the fill (no evidence of ceiling found). No indoor firepits were found; there was an outdoor firepit beside the northeast corner of the ruin. The ceremonial chamber is a typical six-pilaster so-called keyhole or Mesa Verde kiva, 13 ft. in inside diameter at the floor.

Walls

Generally 8 in. thick, exterior walls of building 1 ft. to 1 ft. 4 in. Typical uncoursed or so-called non-Chaco masonry; blocks of stone of irregular size and only roughly shaped, laid up in a single tier with little mortar and very little chinking (compare Roys in Martin 1936; Brand et al. 1937, 71). Weight transmitted directly by rock-to-rock bearing. Probably all walls well plastered with adobe, at least on interior; plaster surviving to height of 1 ft. 8 in. at northwest corner of Room D. Maximum height of standing wall, 4 ft. 3 in. at northwest corner of Room B.

Openings in walls. None. No doorways, windows, or niches (in the dwelling).

Room Floors

In part flagged with sandstone slabs, otherwise of adobe. Fairly smooth and level.

Fill of rooms

Rocks and earth, some clay roof material.

Room A

Approximately 8 ft. by 7 ft.. Irregular adobe floor, containing small stones but no flags. No special features. (See Fig. 6.)

Room B

Average 5 ft. 8 in. by 8 ft. 4 in.. Flagstone floor. Large pit in southwest corner, 2 ft. deep from floor, expanding under the walls; contained only a large quantity of roof-marked lumps of clay. Extensive rodent channels under floor slabs. (See Fig. 6.)

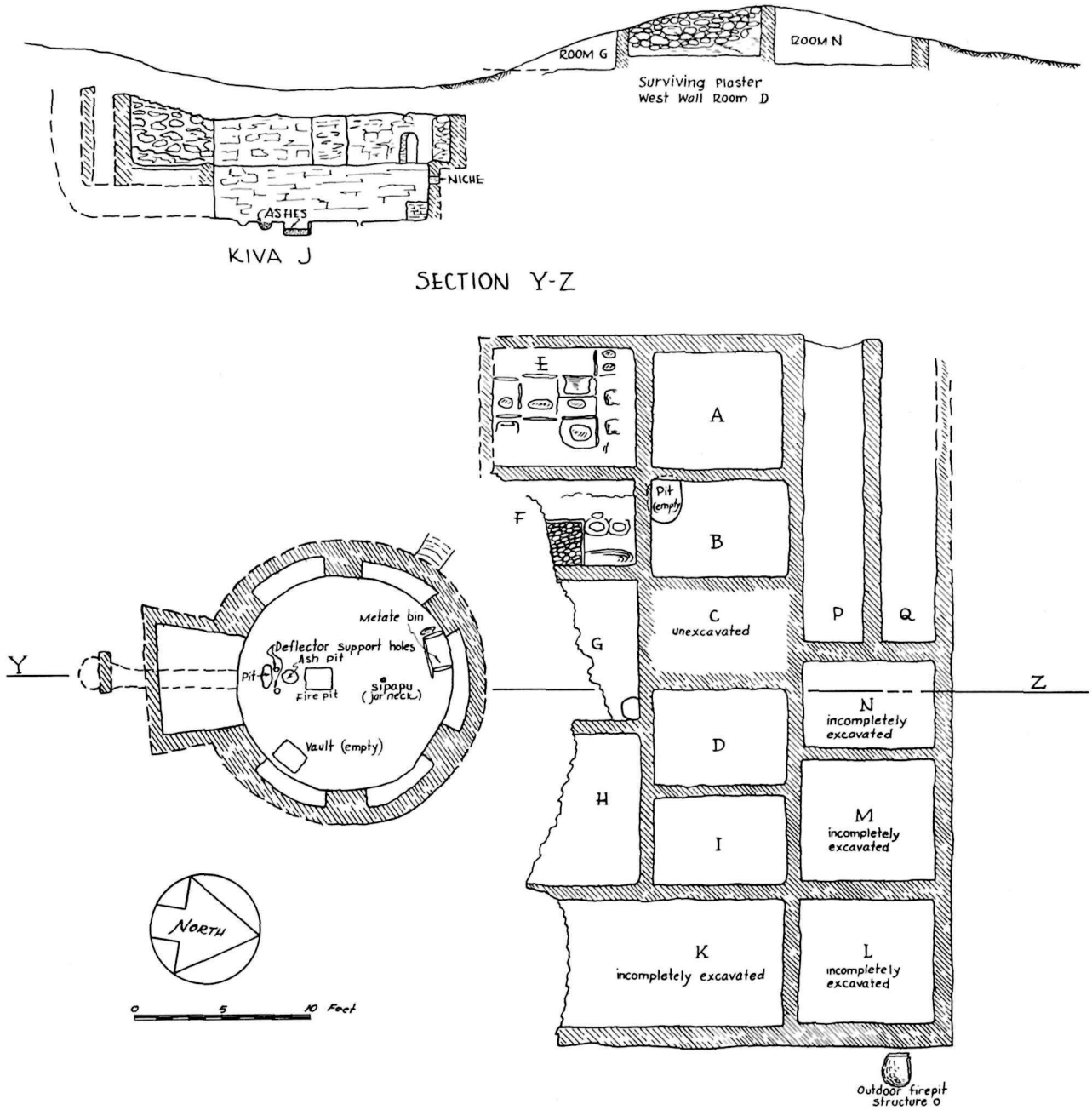


Fig. 5. Plan and section of Site 4.

Room C

Unexcavated, highest part of mound.

Room D

Average 6 ft. by 8 ft. 5 in.. Floor of slabs and plaster-on-dirt. Considerable wall plaster surviving.

Room E

Average 7 ft. 3 in. by 8 ft. 8 in.. Complicated arrangement of grinding bins and small basins crowded together occupying most of floor (see Fig. 7).

Room F

Average 5 ft. by 6 ft. 8 in.. Grinding bins; a rectangular slab-lined vault with sooted stones in bottom (see Site 1, Structures A and B); a pit along the east wall 10 in. deep and 2 ft. 10 in. long, with a maximum width of only 8 in.; ashes in irregular pits in northwest corner; corrugated Jar 4/24 in pit in southwest corner; only fragments of adobe floor among these features. A pair of arrowshaft-smoothers on floor; sandstone disc in vault.

Room G

Eight ft. 7 in. by 5 ft. plus; adobe floor (without slabs) largely eroded away at edge of kiva depression. Corrugated Jar 4/8 set 5 in. below floor in pit in northwest corner, mouth of vessel covered by an octagonal sandstone tablet 3/8 in. thick. Three metates, unfired pottery, bone and Awl 4/2 and Axe Blade 4/6 found on the floor.

Room H

Nine ft. 2 in. by 7 ft.. Adobe floor, largely gone. No special features.

Room I

Average 5 ft. by 8 ft. 2 in.. Floor mostly large slabs, south end unflagged (adobe).

Room K

Seven ft. 4 in. by 14 ft. plus. Outlined; central fill left. Adobe floor. No specimens, no special features. North wall very low, without fallen rocks in the soil around and over it, whereas all other walls of the building extend up to just under the present surface of the ground; possibly K and L were separated by only a perishable partition with a stone foundation, or else the wall was dismantled to combine K and L into a room over 25 ft. long. (See Fig. 8.)

Rooms L, M, N

Outlined only. Adobe floors; no special features.

Rooms P and Q

Pair of corridors separated by a wall 19 ft. 7 in. long and 1 ft. wide, ending



Fig. 6. Site 4, excavated Rooms A and B.



Fig. 7. Site 4, basins and grinding bins in Rooms E and F.

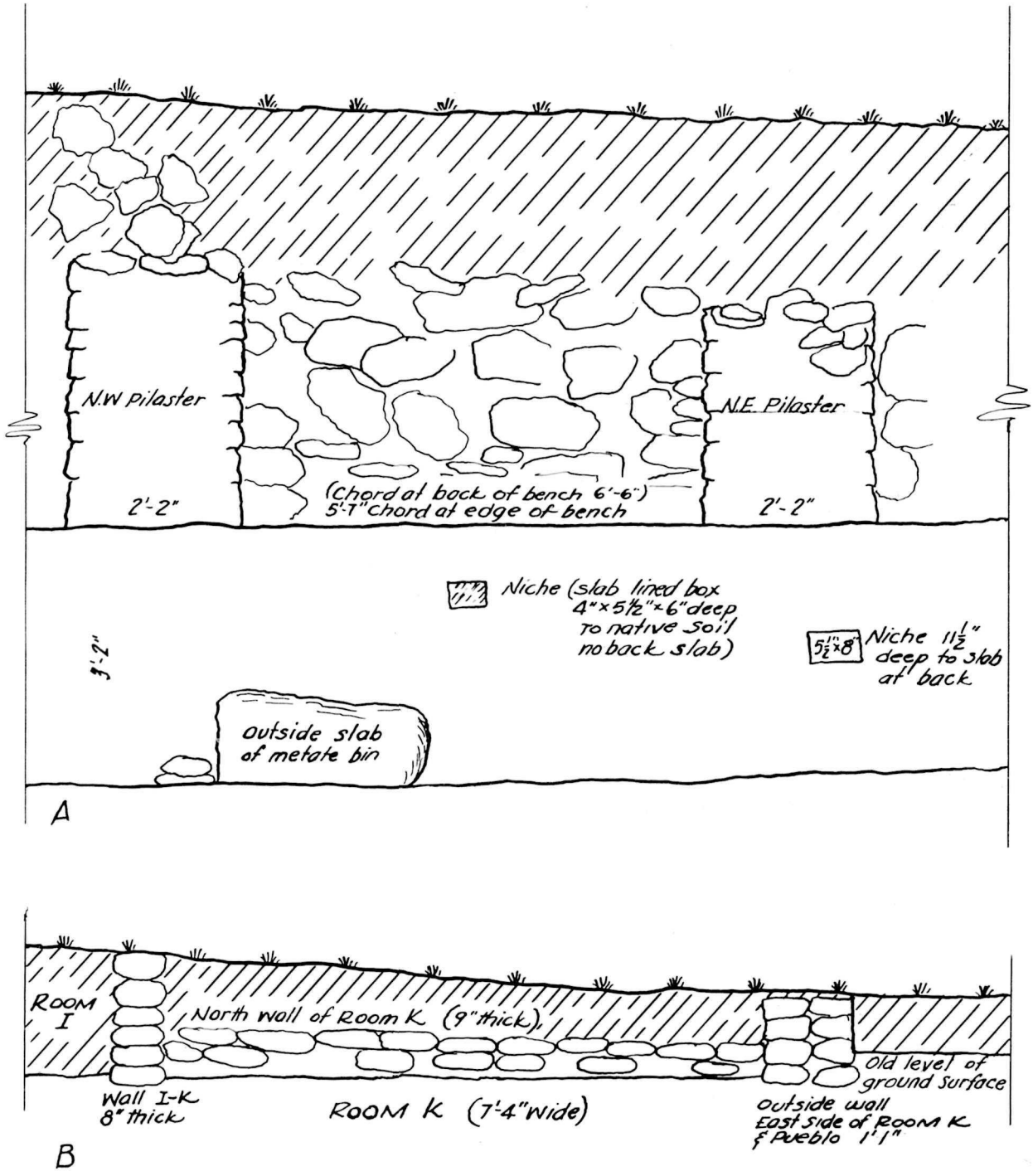


Fig. 8. Architectural details, Site 4. A, north recess, Kiva J. B, north wall of Room K (south wall of Room L). Wall was low as shown, with very few scattered rocks above or around it--the only wall in the pueblo not reaching approximately to present surface.

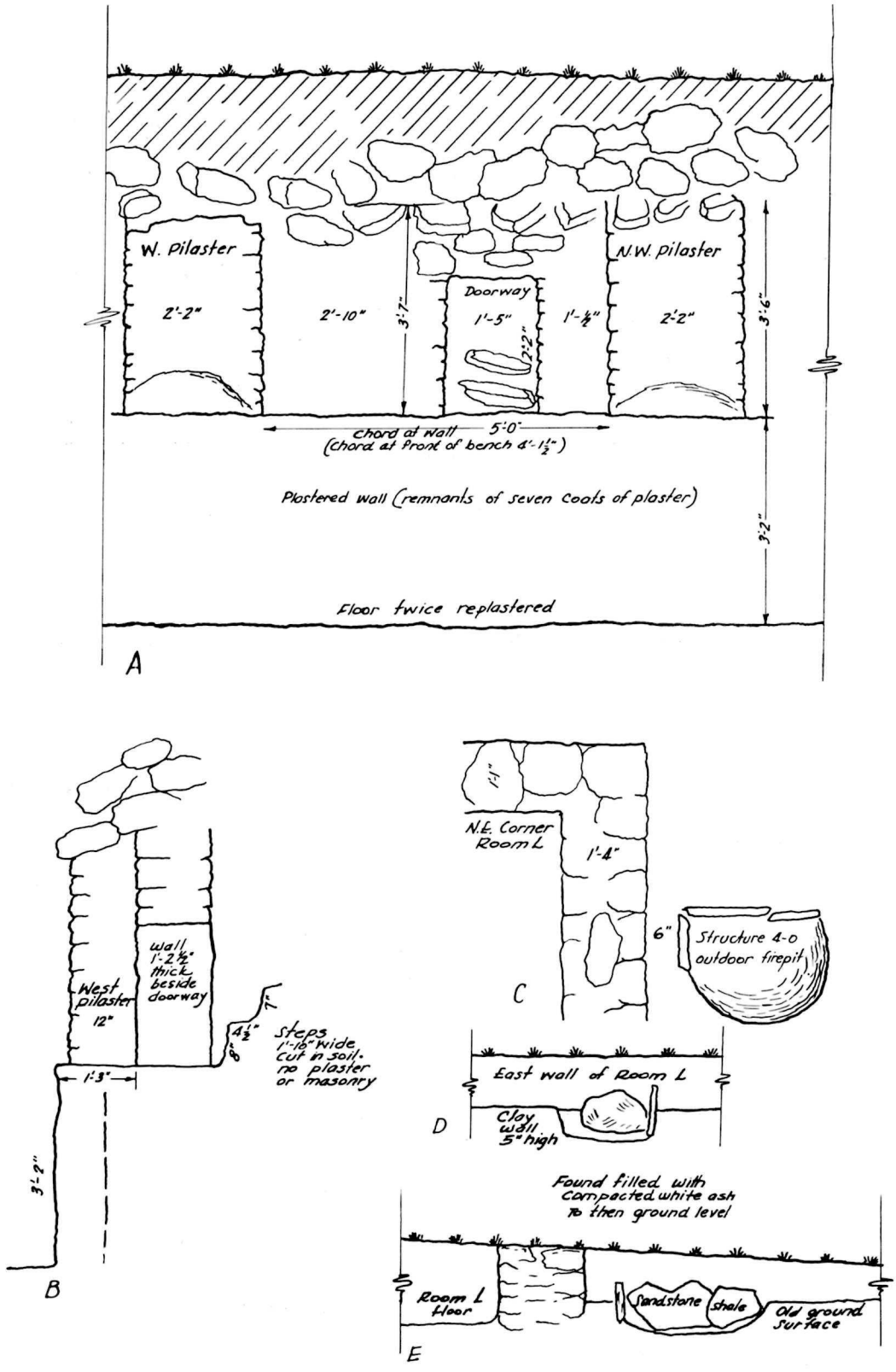


Fig. 9. Architectural details, Site 4. A, northwest recess of Kiva J, elevation. B, northwest recess of Kiva J, section. C, northeast corner of Room L, and outdoor firepit 4 O. D, north-south section of east wall, Room L. E, east-west section of north wall, Room L, and of firepit.

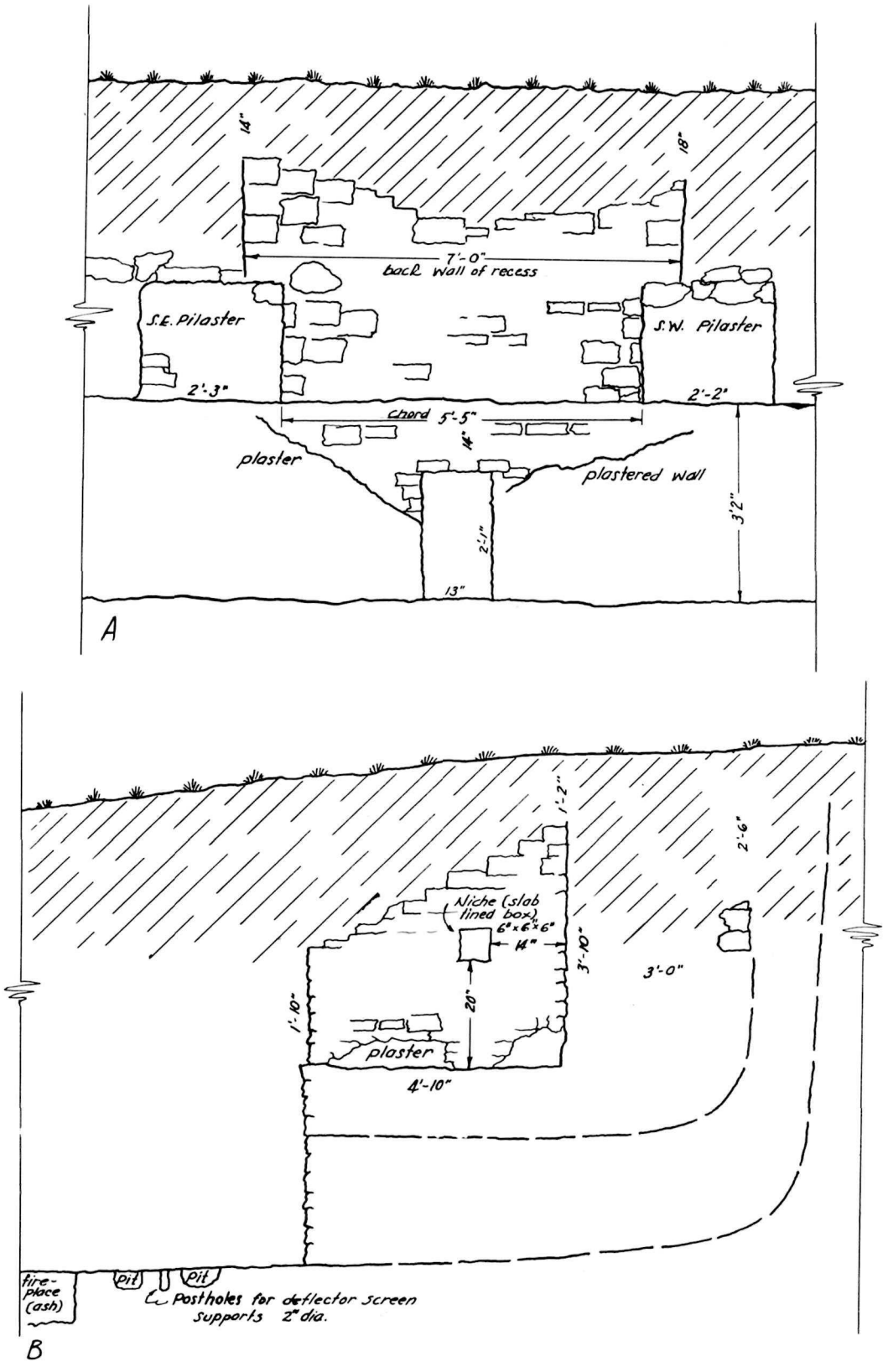


Fig. 10. Architectural details, Site 4. A, south recess of Kiva J, elevation. B, south recess of Kiva J, section.

almost on line with the outer (west) wall of Rooms A and E. No west wall. Adobe floors. Corridor P a genuine room, undoubtedly roofed. The outer (north) wall of Q is rather low, does not continue the full length, and may have been merely a retaining wall or terrace on the side of the little hill.

Firepit O

An oval basin 2 ft. 4 in. by 1 ft. 8 in., clay-lined with small sandstone slabs on two sides; 6 in. deep from old ground level, 10 in. below present surface; filled with compact white ash exactly to old ground level.

Kiva J

Constructed of better masonry, well plastered. Six-pilaster type with large south recess; typical Mesa Verde (see Fig. 11). Doorway into passage (untraceable) to pueblo, probably to the torn-up floor of Room F. Diameter of kiva 13 ft. on floor, 15 ft. above bench. Floor 10 ft. below floors of pueblo rooms. Fill of earth, few rocks, few sherds and bones, little ash or charcoal; the top 10 in. fine material apparently waterdeposited or possibly windblown. Floor twice replastered with 1/4 in. coats. Seven 1/16 in. coats on walls, including south recess; third and seventh layers white and unsmoked. Bench plaster averages 1/2 in. thick, not redone. Floor of south recess, thick plaster-like bench, but two thin coats (1/16 in.) carried across it from wall replasterings. Roof construction unknown, presumably cribwork carried up from stringers laid from pilaster to pilaster (Kidder 1924, 60); the kiva had not burned and very little charcoal was found. (See Figs. 8, 9, 10.)

Bench 3 ft. 2 in. above floor, width 1 ft. 1 in. (northeast and north recesses) to 1 ft. 6 in. (southeast and south recesses). Pilasters 2 ft. 2 in. wide, 1 ft. to 1 ft. 3 in. thick, set in slightly from edge of bench. Wall above bench 1 ft. 2 in. thick. South recess 7 ft. wide at the back, 5 ft. deep. Doorway to passage: in northeast recess instead of north (compare Kidder 1924, 67-68; Morris 1939, 114, Pl. 98; Prudden 1914, 46, 57, Pl. VI: 3; Prudden 1918, Figs. 1, 2, 5), 2 ft. 2 in. high and 1 ft. 5 in. wide.

Passageway. Steps cut in red clay, no plaster or masonry, commencing just behind the wall; 8 in. risers and 4 in. treads (only two steps traceable); roof of passage uncertain, apparently commencing only about 2 ft. above the level of the bench.

Niches. Three little slab-lined boxes in kiva wall. One in east wall of south recess, a 6 in. cube. One under northeast pilaster, 5 1/2 in. by 8 in., 11 1/2 in. deep. One under north recess, 4 in. by 5 1/2 in., no back slab, 8 in. deep, to native soil.

Ventilator. Top of shaft wall found 3 ft. behind south recess at depth 2 ft. 6 in., opening into kiva at floor level 2 ft. 1 in. high and 1 ft. 1 in. wide.



Fig. 11. Site 4, Kiva J: south recess, firepit, sipapu, and empty vault.

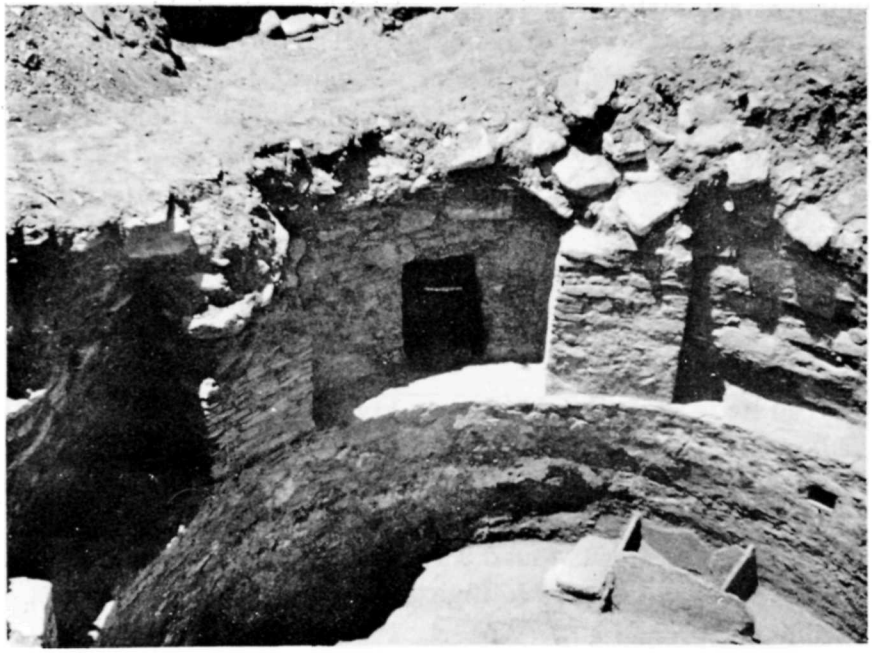


Fig. 12. Site 4, Kiva J: doorway in northwest segment, metate bin, wall niche.

Deflector. No slab. A pair of 2 in. holes, 1 ft. 4 in. apart, between vent opening and fireplace, undoubtedly for support posts for deflector screen. Pit between vent and deflector, 1 ft. 1 in. by 7 in., 3 in. deep; contained one turkey legbone (see references under "Kiva C" below). Pit between deflector and fireplace: 10 in. diameter, 4 in. deep; contained ashes.

Fireplace. Two ft. 2 in. square, walled with thin small sandstone slabs plastered over; depth 10 in. to unfloored soil bottom, last 4 in. compact ash.

Sipapu. A Mancos Black-on-white jar neck, 3 in. in diameter, set into the floor 3 ft. beyond the fireplace; filled with clean fine sand (compare Morris 1939, 90, 94, 109, 110; Martin 1936, 44, note; Prudden 1918, 11, 21; Kidder 1910, 353; Morley 1908, 603).

Subfloor vault. In front of southeast recess; opening and cover slab 1 ft. 3 1/2 in. by 1 ft. 5 in.; 1 ft. 7 in. deep from floor; empty (compare Martin 1936, 42). Narrow flat slabs set horizontally in floor around edges of opening.

Metate bin. Rectangular box of vertical large slabs, against wall below west end of north recess; 1 ft. 5 in. by 1 ft. 9 in. inside, front slab 2 ft. 6 in. long, extending beyond east slab. Slabs 1 ft. to 1 ft. 3 in. high. Slab bottom. No metate. Manos piled on floor beside bin. See Fig. 12.

Site 7

A small unit consisting of a row of four rather large rectangular rooms, one of them enclosing a four-pilaster intramural kiva (compare Morley 1908, Kiva C; Dutton 1938, Kivas B and D), the south ends of the rooms--about half the building--torn away by the road. No additional rooms in front of these four likely, although A and perhaps B might have been partitioned in two. No subterranean kiva found in front of building; may be present and missed. (See Fig. 13a).

Walls

Like Site 4, single tier of flat stones laid up without coursing and with little mortar or spalling. Maximum height of wall surviving, 3 ft. 4 in., at the northwest corner of Room B. Outside walls 10 in. thick, party walls 8 in.

Floors

Adobe without flagstones. Remnants of wall plaster.

Room A

Small, 6 ft. 5 in. long; largely destroyed by road and by tree roots. No special features, burials, or specimens.



Fig. 13. Site 7. A, after excavation, view from the east. B, kiva. C, west rooms, floor pits.

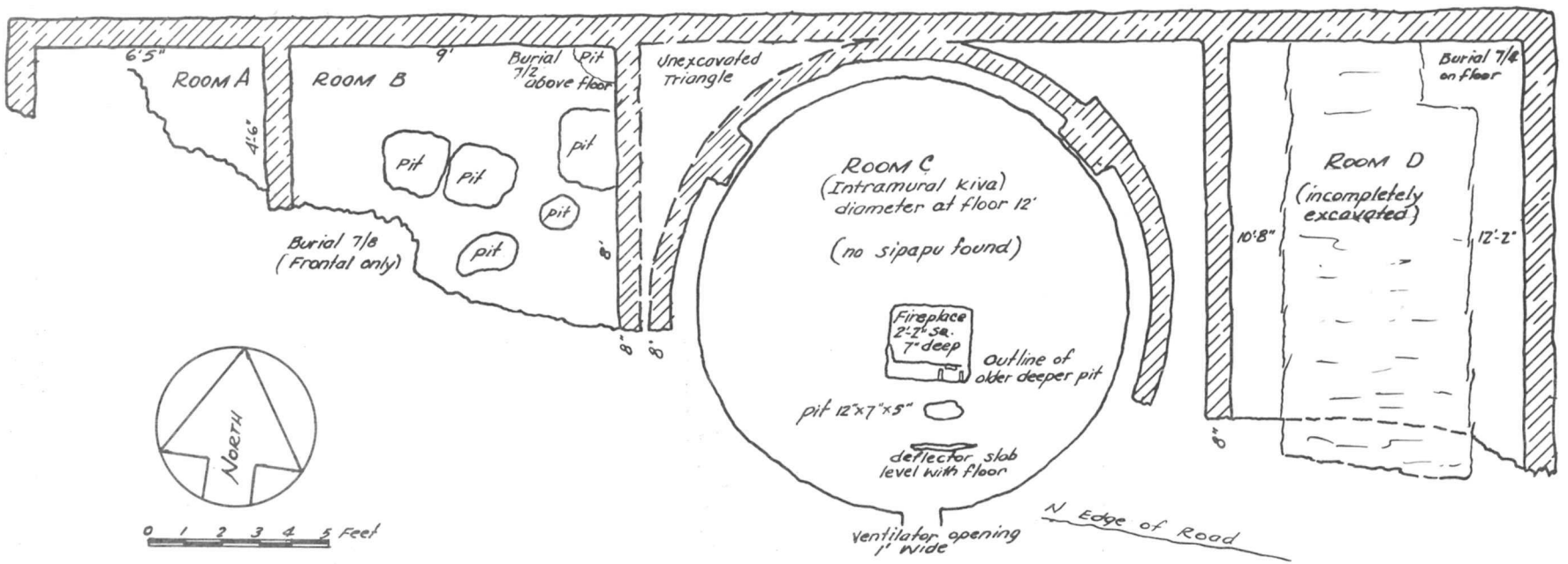


Fig. 14. Plan of Site 7, excavated rooms.

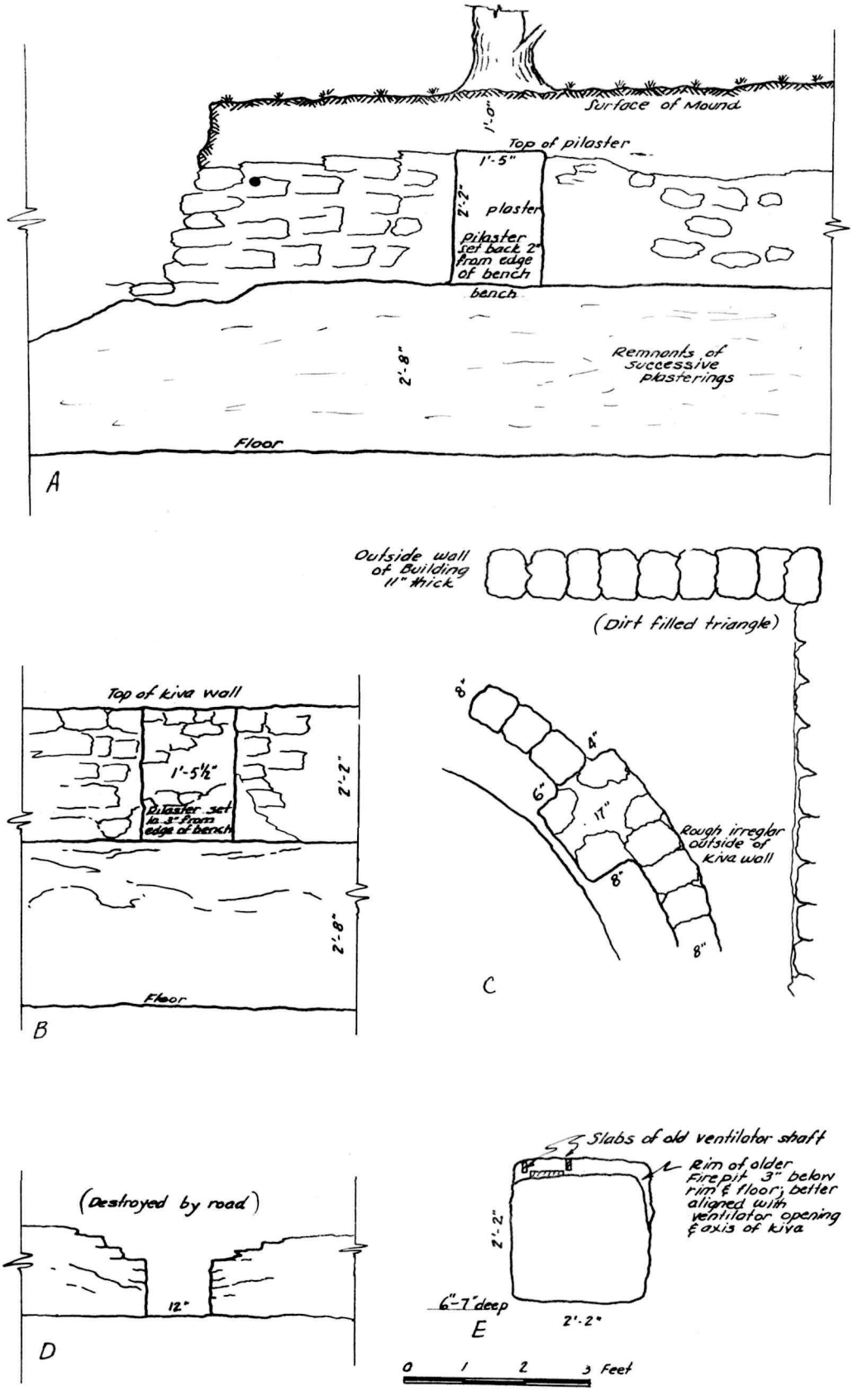


Fig. 15. Architectural details, Site 7, Kiva C. A, northwest pilaster, elevation. B, northeast pilaster, elevation. C, northeast pilaster, plan. D, ventilator opening. E, firepit.

Room B

Nine ft. long, width 8 ft. plus. Burial 7/2 above floor. Several floor pits; Burial 7/7 in one, others empty. (See Fig. 13c.) Floor plaster average 3/8 in. thick; refloored, pits all from upper level.

Room D

Central fill left unexcavated. Width 8 ft. 2 in., evidently had been as long as C. Burial 7/4 on floor near northeast corner.

Kiva C

Diameter at floor 12 ft.. Bench on same level as floors of Rooms B and D, floor of kiva 2 ft. 8 in. deeper. Smooth top of kiva wall 2 ft. 2 in. above bench. Pilasters 2 ft. 2 in. high, 1 ft. 5 in. wide, 8 in. thick; bench 10 in. wide. Note discrepancy and offset at north side of northeast pilaster (Figs. 14, 15). Kiva wall 8 in. thick; like other walls simply a single vertical tier of horizontal pieces of stone, rather better built, but not regularly coursed. Considerable plaster surviving. Floor and walls twice replastered. No niches. No doorway in north segment. South recess and south pair of pilasters presumed to have existed before destruction by road. (See Fig. 13b.)

Fill. Earth and rocks, roof-marked clay lumps; turkey bones, sherds, a few specimens (including three unusual bone tools), pieces of selenite. Ventilator opening 1 ft. wide; upper part destroyed by road. Deflector (?) slab 1 ft. 10 in. by 1/2 in. sunk into floor below replasterings. Pit 1 ft. by 7 in; 5 in. deep, between slab and firepit; contained one turkey leg bone (see Brand et al. 1937, 74; Kluckhohn and Reiter 1939, 161 and see also rabbit burial in slab-lined pit between firepit and ventilator in kiva at Painted Cave: Haury 1945). Fireplace 2 ft. 2 in. square, slab-walled, 6 in. deep. Rim of previous firepit 3 in. below floor, with slabs in front of it as of a slab-lined trench to ventilator; older firepit better aligned with so-called deflector slab and ventilator opening. No sipapu could be found.

Site 1

A pueblo of unit type, probably one-storied, a block of about twelve contiguous rooms in two rows, with one or more outlying rooms connected with the main building by walls enclosing the little plaza; a kiva under the plaza, evidently of Mesa Verde type, two or more slab-lined vaults in the plaza (see Figs. 16, 17). Three rooms and two vaults excavated, east pilaster of kiva cleared to bench. Room walls as at Sites 4 and 7. Adobe floors without flagstones. Height of surviving portions of room walls, a few inches to 2 ft. 1 in.. West wing--evidently a wall with one or more rooms attached--dropped down by erosion. (See Fig. 19.)

Room C

Square small room close to surface, not much left of walls, circular small pit in northwest corner (1ft. diameter, 3 in. deep; empty, no ashes). North and south walls



Fig. 16. Site 1, excavation in rooms, from the north.



Fig. 17. Site 1, Vault B and Room C.



Fig. 18. Site 1, Rock Outline F.

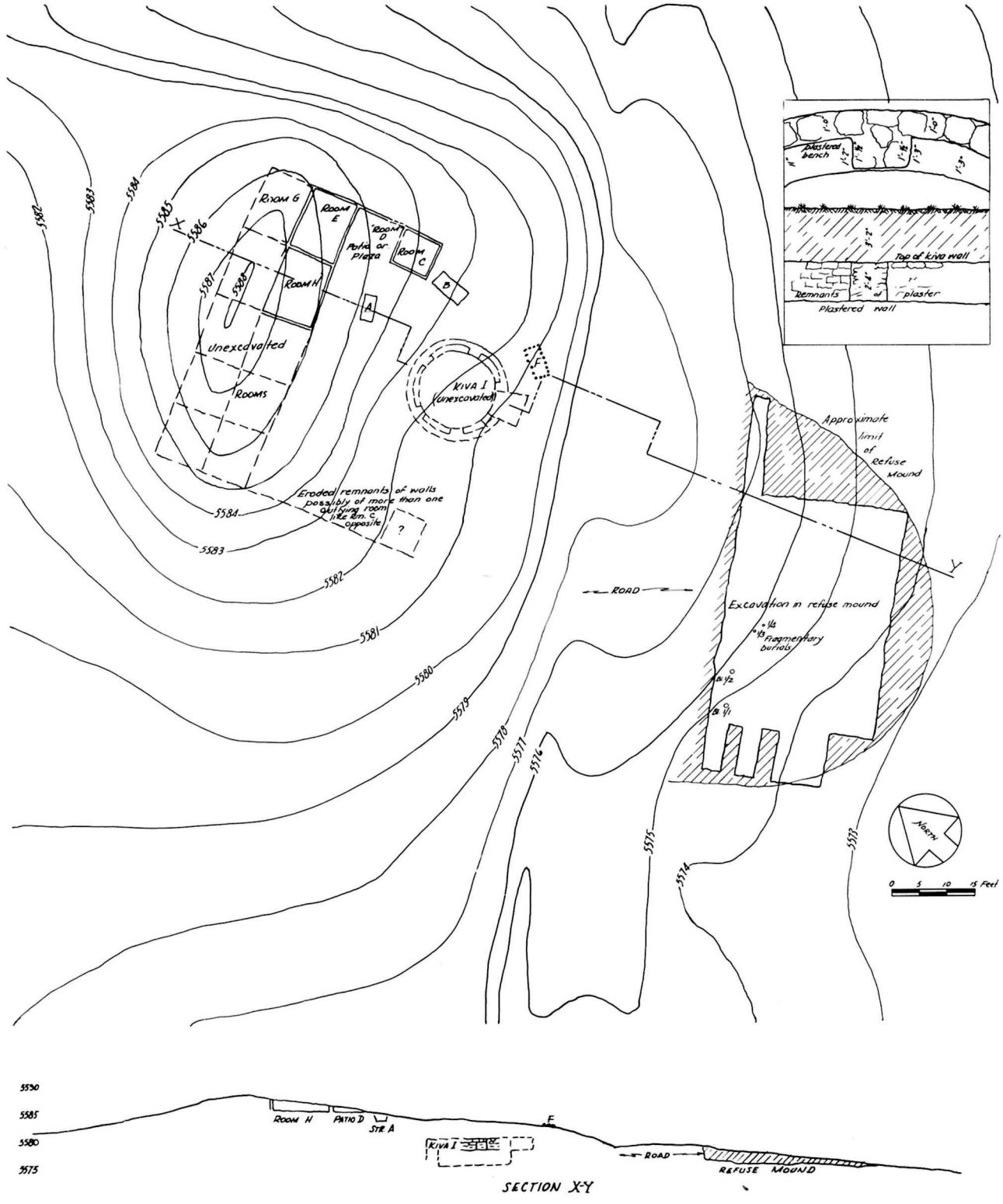


Fig. 19. Site 1: plan, section (somewhat generalized), and architectural details, southeast pilaster of Kiva I.

6 ft. 6 in.; west wall 6 ft. 3 in.; east wall 7 ft. 3 in..

Room E

Average 10 ft. by 9 ft.. A firepit, untraceable except for vertical slabs, like those of Firepit O at Site 4, with considerable ashes in front of them.

Room H

Average 12 ft. 6 in. by 9 ft.. Much burned roof material in fill. (Tree-ring dates obtained: 1192+, 1192+ and 1185+; estimated building date of 1195-1200.) Oval bins like those in Rooms 4E and 4F. Corrugated Jar 1/20 probably had been on the roof.

Structure D

A larger stretch of floor, undivided by partition walls, not enclosed on the southwest, with no postholes or other indications of roofing, probably continuous with the main part of the plaza (largely removed by erosion).

Kiva I

Evidently of the Mesa Verde type, although only a segment of the circumference was cleared. Dimensions observable compare closely to those of Kiva 4H. Top of wall 3 ft. below present surface (which here is a few inches below the former ground level, intersecting it beside Vault B). Height from top of wall to bench, 2 ft. 4 in.. Wall 1 ft. thick, bench 1 ft. 2 in. wide. Pilaster 2 ft. 1 in. wide. Seven or more thin coats of plaster.

Vault A

Five ft. by 2 ft. 3 in., depth 1 ft. to 1 ft. 3 in., commencing 10 in. below plaza Floor D. Relation to Floor D uncertain. Filled with soil, ash, charcoal, burnt stones; a few sherds and animal bones. Vertical thin slabs of sandstone 1 to 2 ft. long, average 1 ft. high, 2 in. thick.

Vault B

Average 5 ft. 9 in. by 3 ft. 3 in.; depth from top of slabs (at plaza level), 1 ft. 7 in.. Near Room C and connected with it by old ground level (plaza floor). Slabs as in A, 11 in. to 1 ft. 10 in. wide. Sooty stones covering the bottom, one layer.

Structure F

An oblong arrangement, 2 ft. 4 in. by 5 ft. 4 in., of large pebbles in a dirt floor or an old ground level just under present surface. From its location, should be below plaza level; possibly a relatively recent structure. No postholes, but a ramada-like covering not unlikely. (See Fig. 18.)

Vault B at Site 1 is definitely related to the pueblo, just outside the southeast room, with the tops of the sandstone slabs composing its walls reaching just to the old ground surface surrounding the room at the level of its floor. The situation of Vault A

is puzzling, however, as the slabs reach only a level 10 in. below the floor designated Structure D and are presumed to be an extension of the plaza. Native soil extends upward from around A for 6 to 8 in.; the top few inches under Floor D are soil containing ashes, but no earlier underlying floor of D could be found. Presumably the vault was connected with and accessible from the plaza, for some reason sunk deeply into the underlying native soil of the hill. Unfortunately, the features of Site 1 having been encountered and cleared in order indicated by the lettering, the dirt above A had been completely removed before Floor D was recognized; and it is not possible to state whether or not the floor extended over the vault. The exactly similar vault at Site 4 is within a room of the pueblo.

The function of Structure F is unknown; that of the slab-lined vaults (including the similar one within a room at Site 4) is uncertain. Indications of heat were found in the vaults, whether for cooking or, as suggested by Kenneth Ross, formerly Acting Park Naturalist at Mesa Verde National Park, on the basis of similar structures not associated with pueblos and excavated by him in the Ackmen district 50 miles north, (see Jackson 1878, 414; Morris 1919a, 193) for firing pottery. There is no evidence of intense heat; the sandstone slabs seem reddened, but not cracked and broken more than the passage of years would make normal. The vaults contained soot-covered stones such as might have been used to heat material in the vault or as the bottom of a hearth. The stones are not split as they would have been by use for hot stone cooking in water.

A similar oblong slab cist, evidently of comparable size, is shown in a National Park Service photograph of the 1934 excavations at Kiet Siel (Southwestern Monument negative 3590). No information on this structure is available. The fill apparently contained ashes and charcoal.

Site 3, Late Component

An east-west row of three small rectangular rooms (see Fig. 20); Floor D probably represents simply the plaza in front of the dwelling, with an enclosing east wall. Floor D extends 6 ft. south before intersecting present surface and disappearing; the wall is traceable another 5 ft. 5 in., and may have continued farther originally, forming a retaining wall or windbreak along the east side of the plaza. Room walls 8 in. thick; typical masonry. Adobe floors. Highest surviving wall, 11 in. - 13 in., north side of middle room, whose floor is lower than the east and west rooms by 3 in. and 2 in. respectively. The house row is 6 ft. 4 in. wide, including the 8 in. walls. (See Fig. 22.)

Kiva H

Diameter evidently about 13 ft. at floor and 15 ft. above bench, as in Kiva 4J. Floor probably 8 ft. below floors of pueblo rooms. (See Fig. 23.)

Fill. Reddish earth with almost no potsherds or ash. Northwest pilaster 1 ft. thick, 2 ft. 8 1/2 in. wide. Top of kiva wall 9 in. wide at north recess. South recess 6 ft. 5 in. wide at back, 4 ft. deep; walls and floor well plastered; wall 11 in. thick,



Fig. 20. Site 3, pueblo rooms and trench across kiva.

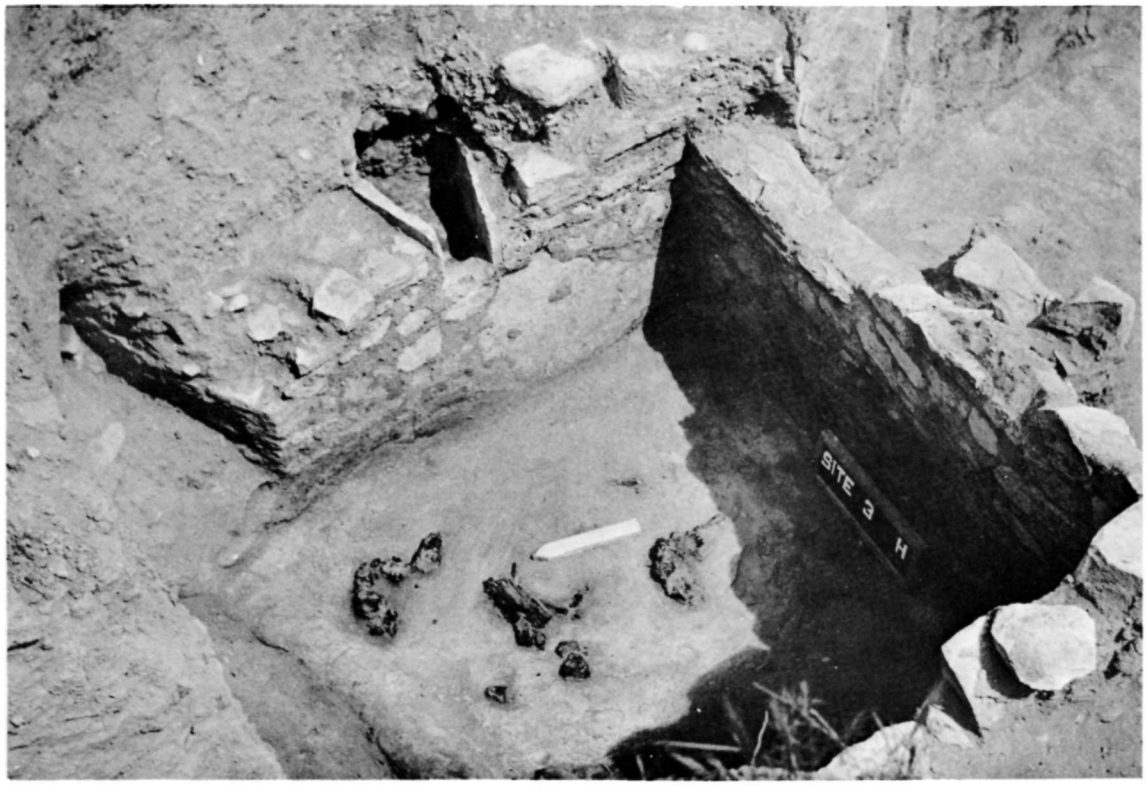


Fig. 21. Site 3, south recess Kiva H.

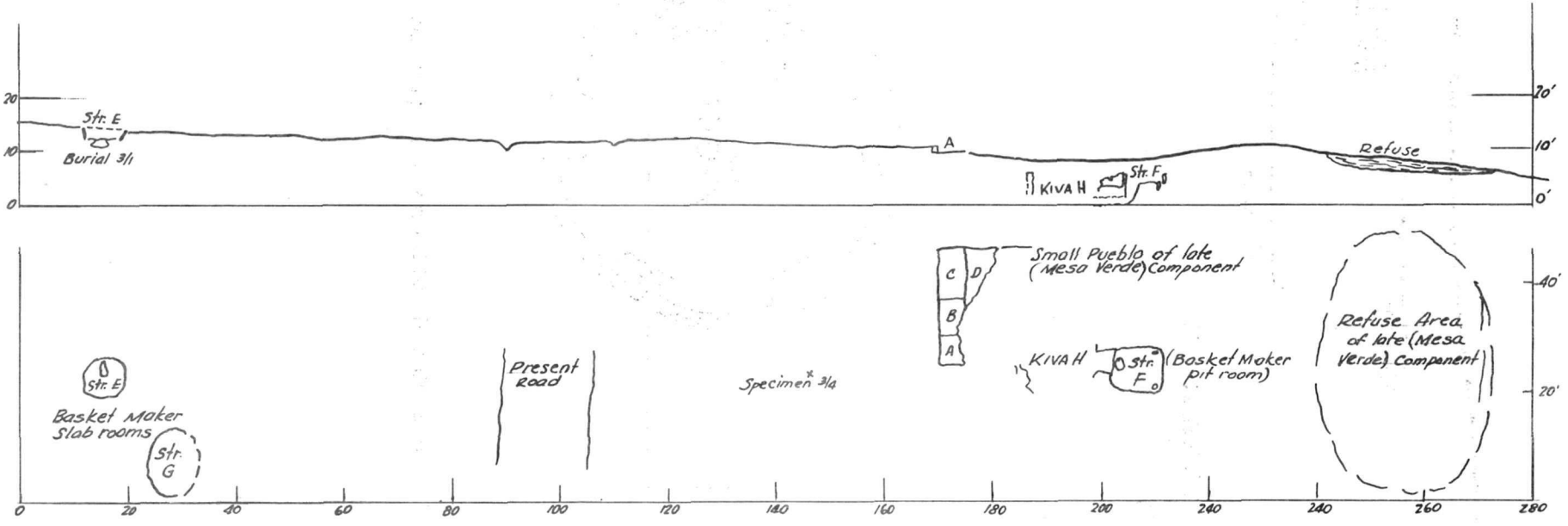


Fig. 22. Site 3: plan and elevation.

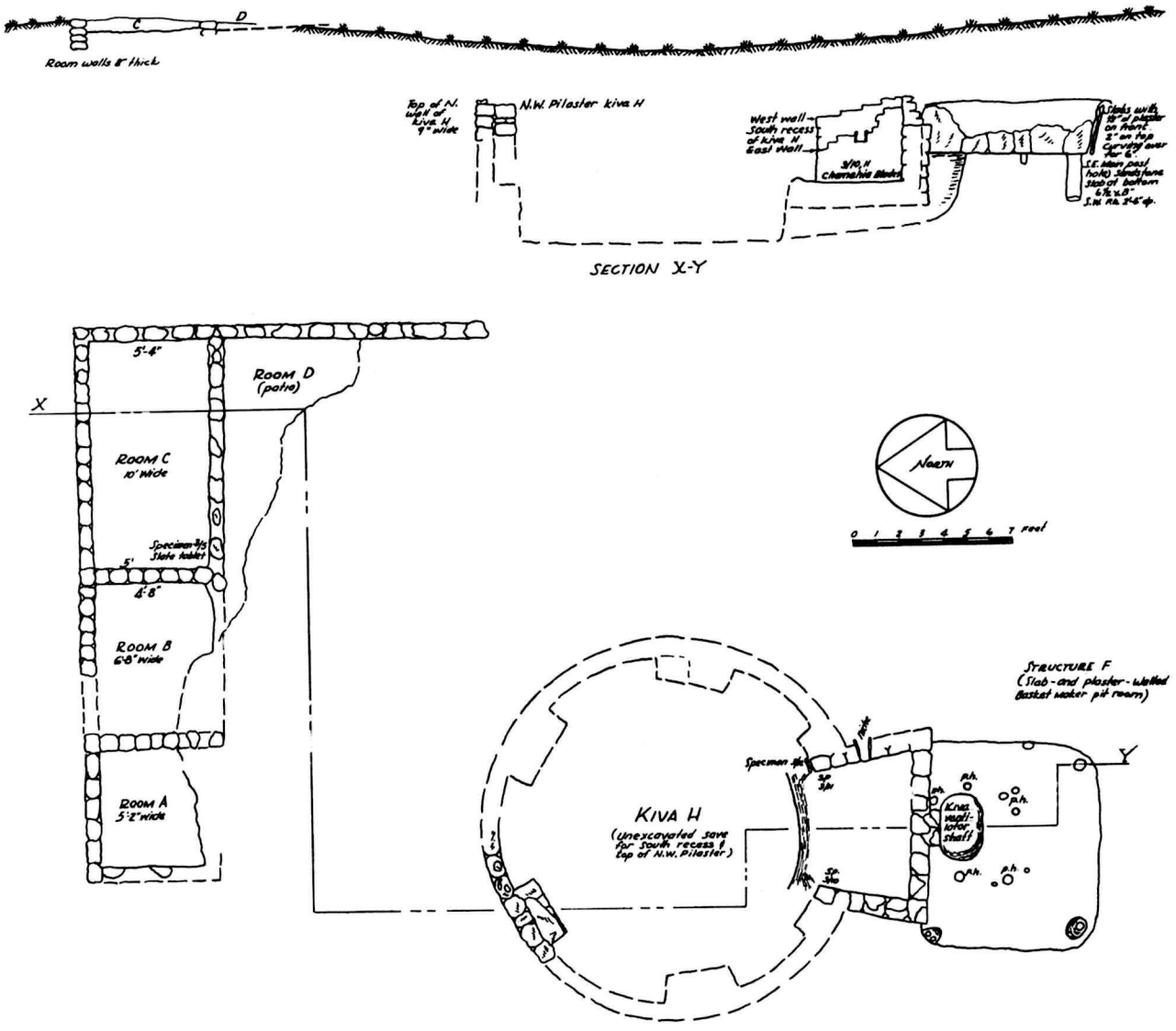


Fig. 23. Site 3, Kiva H and Rooms A-D: plan and section.

Fig. 25. Site 3, slab-lined cist with burial pit.

All burial photos have been
removed from the electronic edition.

Fig. 26. Site 3, Burial 1.



Fig. 27. Site 3, Pit Room F, cut by south recess of Kiva J, Site 4. Juniper charcoal on floor.

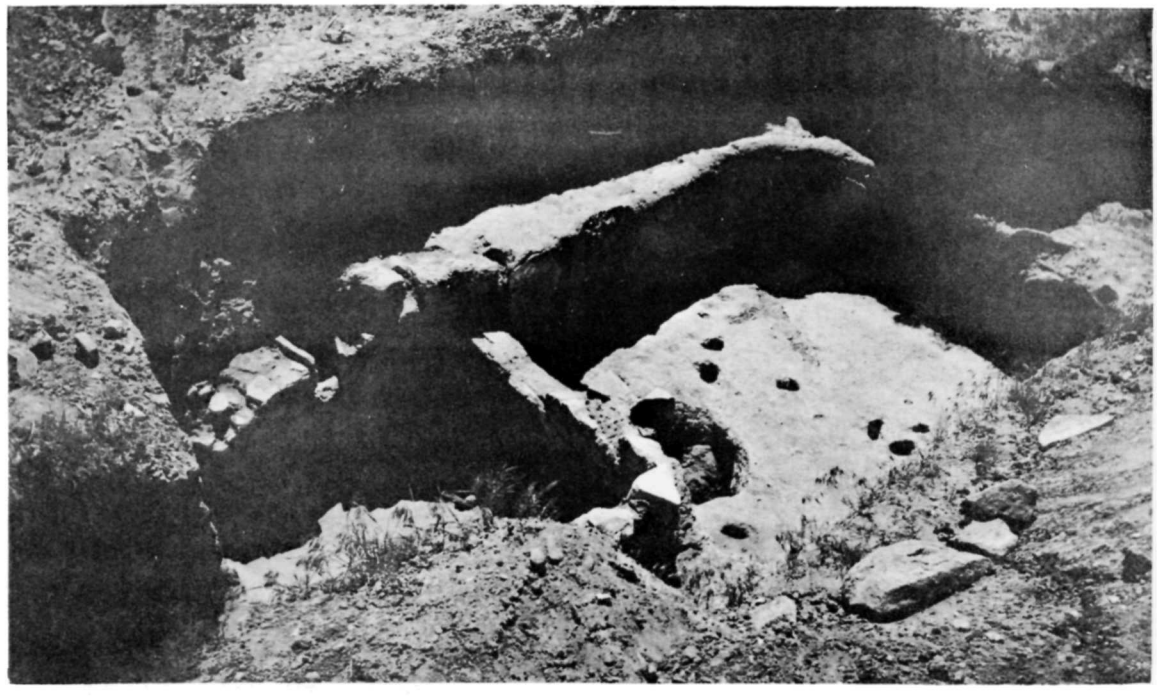


Fig. 28. Site 3, Pit Room F, showing postholes and ventilator shaft of later kiva.

Walls of slabs 2 ft. 2 in. to 2 ft. 5 in. high (top of wall average 2 ft. 5 in. below present surface), covered with heavy plaster (1/2 in. of clay on faces of slabs, 2 in. thick curving over tops of slabs).

Layer 1 ft. thick of fallen roof material, containing much charcoal, on floor; fill of reddish earth above this.

Larger corner postholes, 8 in. in diameter, with sandstone slab bottoms. Cedar (juniper) post in northwest hole. Irregularly disposed small holes across center of floor, some of them rodent channels. No opening in south wall, no antechamber or ventilator or entrance. No firepit. Few sherds, no specimens. Sherds in floor layer and fallen roof material all Modified Basket Maker except one large fragment of Mesa Verde Black-on-white (undoubtedly a stray from the kiva, presumably rodent-borne, although all the way over in the southwest corner).

Four main roof supports are indicated, cedar posts in the four corners, set two ft. or more into the floor, with a little flat stone as a base at the bottom of each posthole. The northeast corner of the room had been removed by the kiva. (See Fig. 28.)

Roof construction could not be determined definitely, despite an abundance of charcoal on and near the floor. Stringers of cottonwood between the main posts on each side evidently carried the roof of juniper poles and brush. No traces of poles slanting up and inward from just outside the top of the wall, as would be expected, could be found. The row of small postholes across the middle of the floor, and others near the ventilator shaft of the later kiva, may have been subsidiary roof supports.

The absence of such standard accessories as a firepit and a vent or entrance in the south wall suggests that this room is itself an antechamber, well made and large, but not extraordinarily so (see Morris 1939, 64; Martin 1938, 342, 346, 370), rather than a quite small house. In this case the main room of the pit house had been entirely destroyed in the thirteenth century by the excavation for the Mesa Verde kiva.

Towers, Twin-kiva Pueblos, and Great Kivas

The double-walled tower near Site 16, discovered by W. H. Jackson in 1874 (Jackson 1876, 374), was described by W. H. Holmes, who visited it in 1875, as follows:

> "The inner wall can be traced throughout the entire circle, and is in places 6 or 8 feet high. A portion of the outer wall, at the point farthest from the river, is still 12 feet in height and in a fair state of preservation. The space between the walls has been divided into cells. . . Four of the cross-walls are still a number of feet high, while others can be traced by lines of debris. The diameter of the outer wall is 43 feet; that of the inner 25 feet. . . The main walls are 21 inches in thickness, while the partition walls are somewhat lighter, and seem to have been but lightly built into the circular walls." (Holmes 1878, 392.)

The tower still survives to almost the same maximum height (see Frontispiece A); the partition walls, however, have collapsed further and are scarcely noticeable. I measured the outer diameter as 46 ft. and the inner as 25 ft. 8 in..

The tower is out in the open on the canyon floor, in a bend of the canyon with a view in both directions. A small mesa-point of sandstone overlooks it. Site 16 is on the talus slope under this little cliff; it is a pueblo unit 60 ft. long, with a 40 ft. kiva depression in front of it. The pottery (collection LA 2376) is of the Mancos phase. Holmes (1878,392) described the site thus:

> "On the point of a low rock promontory that extends down from the mesa on the west to within a few yards of the circular ruin are some masses of decaying wall, and a large circular depression, not differing in appearance from the usual estufa."

"A few hundred yards below the great tower, and very near the trail, a small tower occurs, having other ruins connected with it." This is a single-walled tower 10 ft. 10 in. in inside diameter, the wall 2 ft. thick, half of it standing 3 ft. 6 in. to 5 ft. high, the other half gone. It was visited and photographed by F. H. Chapin in 1890 (Chapin 1892, 125, Pl. opp. 108). About 100 feet south of the tower is Site 27, a very small unit with a 25 ft. kiva depression, yielding Mancos pottery. This tower is back in the rincon just below Site 16, with no view for any distance up or down the canyon.

Double-walled towers, with indications of compartmentation of the space between the walls, are reported at the mouth of the Mancos (Holmes 1878, 390 and Pl. XXXIII: 2), on the San Juan below Shiprock (10 mi. above the mouth of the Mancos) (Holmes 1878, 389 and Pl. XXXI), at Mud Spring on the McElmo northeast of Ute Mountain, (Holmes 1878, 398 and Pl. XXXIX) and elsewhere in the general area. Simple single-walled towers are more common (Fewkes 1917, 89-92; 1919).

Towers incorporated in the pueblo occur in Mesa Verde cliff dwellings. A tower is associated closely with a large open pueblo at Mesa Verde Site 34 (O'Bryan 1950, Fig. 25--plan). Towers associated with small pueblos of the general unit type, with a passageway from the floor of the tower into the kiva, are reported from the Ackmen-Lowry district of the Hovenweep drainage (Martin 1929, 26, 30-31; 1930, 23-24). These "kiva-towers," as they may conveniently be called, are not reported from other districts, save for at least one instance from the Mesa Verde where a passage from the floor connects the structure known as Cedar Tree Tower with the kiva adjoining it; no pueblo seems to be associated (Fewkes 1921).

Heaps of fallen rock across the kiva depressions from the small pueblo units distinctly suggest towers at three or perhaps four twin-kiva sites in Mancos Canyon. Survey Sites 5, 9 and 30 each consist of a pair of depressions each 20-25 ft. in diameter, with an extremely small pueblo. These are Mesa Verde sites, according to their

pottery. Site 11 combines a similar pair of depressions with a refuse mound which covers the whole span from Basket Maker III to Mesa Verde; the depressions are believed to contain Mesa Verde kivas rather than early pit houses. No pueblo at all is associated. A rockpile on the margin of one of the depressions suggests that those which are thought to represent towers at the three twin-kiva sites mentioned.

A similar rockpile occurs across the kiva depression from the pueblo at one of the normal unit types, Site 29. In this case the foundation of the tower can be discerned, a typical wall forming the base of a structure 8 ft. square. The pottery of Site 29 is Mesa Verde. Kiva-towers are not present, so far as known, at the other unit-type pueblos.

The height of these kiva-towers probably was not great, judging by the amount of fallen rock at each; possibly not much greater than that of an ordinary single-storied room. I presume that these are comparable to those of the Ackmen district with passages to the kiva.

A site somewhat resembling the twin-kiva pueblos was excavated by Prudden in 1915 on Bug Point, northwest of the Ackmen-Lowry district and in the Montezuma drainage (Prudden 1918, 26-36), close to the Wilson or Monument ruin excavated by Leh in 1937-1940. The pair of depressions, in one of which a test confirmed the presence of a kiva, and an exceptionally large kiva, lies in front of a single row of about ten rectangular rooms. No tower foundation or rockpile is mentioned.

In effect this is, as Prudden says, simply a double unit. The kivas are widely separated, and the pueblo unit 92 ft. long is much bigger than those at Mancos Canyon Site 5, 9, 30. Unusual quantities of artifacts, flint flakes, and charred corn were found in the pueblo; there is no question as to its normal, domiciliary function. The pottery illustrated by Prudden from this site is mostly well developed Mesa Verde.

Neither the kiva-towers nor the detached towers could have served satisfactorily as defensive structures or lookouts. Both in Mancos Canyon and in the Hovenweep drainage to the northwest, where many towers and so-called castles are found, these buildings are generally not suitably placed for military purposes. Towers are to be found down inside a box canyon, or right beside a mesa point with a commanding view. The less dramatic term "silo" would be equally descriptive and possibly just as applicable (see Bennett and Zingg 1935, 153).

The standard archeological evasion, "ceremonial use," is supported by a number of considerations: the occurrence of towers connected with kivas by concealed passages; the occurrence of presumed towers with pairs of kivas lacking domiciliary units of normal size; the occurrence in the area of other large structures of unusual ground plan and presumed ceremonial significance, to which the double-walled towers in particular show some resemblance.

The general area of southwestern Colorado and the Mesa Verde period in particular are charcterized by peculiar buildings in which kivas are usually emphasized, as well as by towers.

> "Structures of bizarre ground-plan intentionally laid out and not the result of restrictions imposed by the building site, are more plentiful, I believe, in the Mesa Verde domain than in any of the neighboring areas. As instances I cite the triple-walled tower on the McElmo; Sun Temple, Mesa Verde National Park; the D-shaped house at site 33, Johnson Canyon; the quadrant-shaped building at site 41, la Plata; and the circular ruin between the two main pueblos at Aztec Ruins National Monument. Some of these, such as Sun Temple, seem pretty clearly to have been ceremonial places, but others, notably the D-shaped house at site 33, building XVI at site 41, and the circular ruin at Aztec, were dwellings." (Morris 1939, 37.)

In addition there are the detached and incorporated towers which have been discussed; a structure closely resembling Building XVI at La Plata Site 41 reported nearly seventy years ago from the San Juan near the mouth of Montezuma Creek; (Jackson 1878, 416 and Pl. XLVIII; Fewkes 1919, 22) the Hovenweep so-called castles; a double-walled tower just north of the main pueblo at Aztec; and others.

Such things also occur in the Chaco Canyon area, in addition to the great kivas discussed below: Kin Klizhin and Kin Yai are essentially tower-kivas, with high walls and few associated rooms, and the razed structure adjoining Pueblo del Arroyo was a great tower of some sort rather than a great kiva (Judd 1927, 165). Additional investigation of the three-walled structure at Pueblo del Arroyo by R.G. Vivian confirmed this, determined that it is part of a complex of structures connected with the main pueblo, indicated that it probably was not very high, and revealed other very interesting details (Vivian, n.d.b.).

The expenditure of considerable effort on purely ceremonial structures by the otherwise practical and sensible Anasazi seems indicated. Most of the buildings that have been mentioned are difficult to explain as utilitarian. I have wondered if the "kivas" (Roberts 1930), "proto-kivas" (Morris 1939, see esp. p. 72), or "house-kivas" (Martin 1938) found with surface rooms of flimsy construction in Pueblo I sites of this area are not simply the winter houses; but in the Classic Period, Chaco-Mancos and Mesa Verde times, the surface pueblo obviously was suitable for winter occupancy and the kivas were surely ceremonial rooms. Structures of bizarre ground plan, towers, and twin-kiva sites probably all are to be considered as generally ceremonial in purpose.

Site 28 in Mancos Canyon, however, has a high enough proportion of domiciliary rooms to be considered simply as a pueblo intermediate between the unit type

and the large ruins. Its two observable kivas accompany several wings, as if two unit pueblos had been combined and further accretions added.

Towers not observed by me were seen by Jackson and Holmes in lower Mancos Canyon, and one of these also by Fewkes 40 years later. Jackson reports one five or six miles up the canyon--in the vicinity of twin-kiva Site 9:

> "Close to our camp was one of the little towers that occur quite frequently, about 10 feet in diameter, and now some 8 feet in height, with the inside half-filled with the debris from the walls" (Jackson 1876, 375).

Another, with associated room foundations, also visited by Holmes in 1875 and by Fewkes 25 years ago, was on the south side of the river, about 8 mi. up the canyon (Jackson 1876, 378 and Fig. 13; Holmes, 1878, 391; Fewkes, 1919, 58). The tower was 12 ft. in outside diameter, 9 ft. inside, standing about 16 ft. high. There was a small doorway, 18 in. by 24 in., about 8 ft. from the ground. The associated structure was divided, according to Jackson, into two rooms each about 15 ft. square (Jackson 1876, 376 and Figs. 2,3--Pl. 1); Holmes shows two rooms each 35 by 40 ft. and an additional smaller room (Holmes 1878, Pl. XXXIII: 3). In 1874 there was also a corner of a house, with one side of a 6 ft. doorway, standing to a height of several feet nearby (Jackson 1876, 376-377, Fig. 4--Pl. 1).

Forty years later, Fewkes found the Holmes Tower in much the same condition:

> ". . . 10 feet in diameter and about 16 high, with a broken window on the north side. . . on the north there are mounds indicative of rooms and two circular saucerlike depressions . . . a burial place southeast of the tower, where the surface is covered with fragments of pottery" (Fewkes 1919, 59, Pl. 29a).

The standing house corner is not mentioned by Fewkes. The Holmes Tower, in the southwest quarter of Sec 32 T33W R16W, is still as Fewkes describes it.

The true standardized great kiva seems to belong to the Chaco-Mancos period. The several examples in Chaco Canyon presumably belong to the main occupation there; the occurrence to the southwestward at Nutria is of the same general period (Roberts 1932). In the north, the excavated and restored one at Aztec was built in the Mancos period and apparently disused in the Mesa Verde period (Morris 1921); the great kiva at Lowry Ruin yielded a tree-ring date of A. D. 1086 (Martin 1936, 195). The cliff ruin called "New Fire House," in a side-canyon in the Mesa Verde, close to Sun Temples, has the features of a modified and squared great kiva. Prototypes of the Great Kiva have been found on the mesa south of Johnson Canyon, a Pueblo I example with a tree-ring date of A. D. 831 (Morris 1939, 83-84); at the Basket Maker III village excavated at Chaco Canyon (Roberts 1929, 73-81); and in the

Lowry district, at a site whose pit houses yield dates of A.D. 855 to 870 (Martin 1939, 350-359).

Large kivas at Chimney Rock ruin on the Piedra (Jeancon 1922) and at Far View House on the Mesa Verde (Fewkes 1917a) seem to lack Great Kiva features.

There seems to be no example of the true great kiva in Mancos Canyon; but either one of the unusually large kivas noted may perhaps have the features of the type, although the peripheral small rooms are not in evidence.

The large westernmost Mancos Canyon pueblo, Site 18, evidently has an intramural second-story kiva, like those observable at Yucca House, and "Kiva A" at Lowry (Martin 1936, Fig. 6), in a depression in the upper portion, which is 30 ft. in diameter; but in addition, there is a so-called semi-detached very large kiva adjoining the east end of the building at Site 18. A depression below ground level is enclosed in a square by a masonry wall, the foundation surviving to present ground level. The wall is 1 ft. 4 in. wide, and stood at least 6 ft. high (the fallen wall is clearly observable in the ground at several points). The north-south measurement within the enclosure along the east wall is 50 ft.. The west wall is covered by debris from the pueblo ruin, and probably was a party wall with the main building.

The kiva, if that is what the depression represents, could be up to 48 ft. in inside diameter or 40 ft. if allowance is made for a deep south recess--less if it is surrounded by little cells. There are,however, no indications of peripheral rooms. The reason for surrounding a subterranean kiva with a square is unknown; such enclosure is not recorded for the excavated great kivas.

The other large pueblo, Site 15, at the mouth of Navajo Canyon, evidently has a similarly enclosed subterranean kiva adjacent at the east end; but the actual depression is only about 25 ft. across, within an embankment of a more or less circular mound 3 ft. high and 10 ft. wide, which could conceivably be the ruins of circumjacent rooms, though no masonry is visible.

The depression at Site 16 is 46 ft. to 55 ft. across; but this is on a steep talus slope, and a normal-sized kiva seems probable. At the other small sites, the kiva depressions are 29 to 30 ft. in diameter.

CHAPTER IV

BURIALS

Site 3, Early Component

Burial 3/1

Adult female, in undercut floor pit of Basket Maker III slab-lined circular cist. Badly disturbed by rodents. Semiflexed on left side, head to west. No offerings, slabs piled in pit over burial. Undeformed dolichocephal. Burial pit 1 ft. 4 in. deep (from floor of chamber), 3 ft. 4 in. by 2 ft. 2 in. at the top, 3 ft. 8 in. by 2 ft. 5 in. at the bottom. See Fig. 26.

Site 11

Burial 11/1

Adult male, in refuse. Depth uncertain, since in bottom of bulldozer swath. Skull gone, one femur, probably from this burial, in a dirt pile 100 ft. away, some of other bones scattered; just enough remaining in situ, including the torso, arms, broken legbones, and left foot, to give the position clearly. Semiflexed on back, knees up, arms extended at sides, head to east. Rosa Gray Jar 11/1 and Rosa Black-on-gray Bowl 11/2 at right side, hit by bulldozer but restorable. Skull type unknown.

Burial 11/2

Senile male, in refuse, shallow; at west end of bulldozer swath, depth 6 in. from surface. Semiflexed on back, arms slightly flexed, head to west. Two Pueblo I Black-on-white bowls, 11/18 and 11/20 (incomplete), at shoulders. In Pueblo I refuse, overlain by a little Mesa Verde refuse. Cranial deformation more or less lambdoid (back of skull damaged; see T. D. Stewart's report, Appendix B). See Fig. 31.

Burial 11/3

Infant in caliche, under Pueblo I refuse, 6 ft. deep from the top of the refuse mound. Extended on back, arms at sides, head to east. Two plain gray small pitchers affinis Rosa, and black-on-gray Bowl 11/24. Lambdoid deformation. See Fig. 32.

The former presence of other burials, in the bulldozed-off portion of the refuse mound, is attested by scattered fragments of infant and adolescent bones found on dirt piles, including the fill of the bridge approach, and on the surface of the bulldozer swath.

Site 1

Burial 1/1

Infant, shallow in refuse 8 in. below surface. Distorted position, semiflexed

Fig. 29. Infant burial in Site 1 refuse, disturbed and incomplete, flexed.

Fig. 30. Infant burial in Site 1 refuse, disturbed and incomplete, flexed.

All burial photos have been
removed from the electronic edition.

Fig. 31. Adult burial in Site 11, semi-flexed on back, with Pueblo I black-on-white bowls.

Fig. 32. Infant burial in Site 11, extended on back; an early instance of lambdoid deformation, with pottery of Rosa affinity (Pueblo I).

ventrally and on left side (compare Morris 1919a, Pl. 61a; Nordenskiold 1893, 75, Fig. 45)right arm extended, head to south and up, facing south. Several bones missing. Mancos Black-on-white Bowl 1/3 associated. Strong lambdoid deformation. Fig. 29.

Burial 1/2

Child, extremely shallow in refuse--the frontal would, if present, have reached the surface, which may explain why it is not present. Disturbed and incomplete. On back with head to southeast. No offerings. Strong lambdoid deformation. Fig. 30.

Burial 1/3

Infant very shallow in refuse, 4 in. from surface, fragments only. No offerings.

Burial 1/4

Small infant very shallow in refuse, skull fragments only. Tusayan Black-on-red Dipper 1/18 found 1 ft. 6 in. away at same depth of 4 in., presumably associated. Lambdoid deformation.

Site 7

Five burials in refuse, two adult:

Burial 7/1

Complete, fair condition. Semiflexed on right side, arms extended, head to south. Small Bowl 7/1, Mancos Black-on-white, under right shoulder. Lambdoid deformation. See Fig. 33.

Burial 7/6

An occipital bone only, evidently representing a burial on the back with head to east. A small Mancos Black-on-white bowl, 7/10, and a little cup of plain rough gray affinis Rosa 7/9. Lambdoid deformation.

Three infant burials in refuse, covered by large sherds, without other offerings:

Burial 7/3

Deep in refuse, fairly complete. Semiflexed on left side and ventrally, arms extended, head to south, face down. Covered by four large corrugated sherds, one of which is illustrated in Fig. 51, lower right, and accompanied by a fairly large black-on-white bowl sherd, 7/16 (Fig. 51, lower left), and three sherds of a Mancos Black-on-white half-gourd ladle, 7/14 (Fig. 51, upper left).

Burial 7/5

Deep in refuse, fragmentary. On left side, right arm semiflexed, head to east, face to south. Covered by inverted large Sherd 7/6, half of a Mancos Black-on-white bowl.

All burial photos have been
removed from the electronic edition.

Fig. 33. Young adult female burial in Site 7, with one Mancos Black-on-white bowl.

Fig. 34. Child burial in Site 7, face down in floor pit in Room 7B, no offerings.

Burial 7/9

Deep in refuse, fragmentary. Position uncertain. Covered by inverted large Sherd 7/12, over half of a Mancos Black-on-white.

Four intramural infant burials without offerings:

Burial 7/2

Among fallen roof material, 4 in. above floor. On back with arms extended, legs probably semiflexed. Head to west, face turned to right (south). Lambdoid deformation.

Burial 7/4

On floor. Semiflexed on back and right side. Head to east, face up and northeast.

Burial 7/7

In floor pit 1 ft. 7 in. by 1 ft. 2 in. and 10 in. deep. Skull 4 in. below floor of Room B. Semiflexed face down, arms extended, head to south. Lambdoid deformation. Fig. 34.

Burial 7/8

A skull fragment (frontal bone) in a disturbed pit at front of broken floor where cut by the road; remainder presumably destroyed by road.

Summary and Discussion of Burial Methods

The few burials found exhibit considerable variety in arrangement; but the most characteristic pose seems to be semiflexed on the back or side, with the arms more or less extended, and with one or two pottery vessels at, near, or under, the shoulders.

The single Basket Maker III burial, an adult, is semiflexed on the right side without offerings. The two Pueblo I adults (11/1, 2) are semiflexed on the back with two pots each; the one complete adult of the Mancos period is semiflexed on the right side, with a pottery bowl under the shoulders.

The infants are more variable. Those of the Mancos period whose position could be determined are semiflexed, either on the back or more or less face down in a twisted position. Two at Site 1 lack offerings, two are accompanied by a complete bowl each, while the three infant burials in Mancos refuse at Site 7 are covered by large sherds. No burials of the Mesa Verde period were found, unless the intramural ones at Site 7, lacking offerings, are such. Burial in rooms occurs commonly in the Mesa Verde period (Morris 1939, 39).

The infant accompanied by Rosa-like pottery, buried in caliche under Pueblo I at Site 11, is the only definite extended burial.

Predominance of flexed or semiflexed burial is, of course, typical in this area, characteristic not only of the San Juan but of the entire Anasazi area, including the upper Rio Grande and the northern affluents of the Little Colorado. Extended burial occurs as a subsidiary trait in the San Juan; most often, probably, of subfloor infants in Chaco sites (Pepper 1920, 264; Dutton 1938, 55; Brand et al 1937, 1944). A cemetery of extended inhumations at Pipe Shrine House on the Mesa Verde is reported (Fewkes 1923, 101). Only a very few extended Basket Maker III burials are recorded (Morris 1939, 56, 73); there are a number of other Pueblo I instances like Mancos Canyon Burial 11/3. An extended inhumation face down, perhaps exposed prior to burial, was found in the Rosa phase (Pueblo I time, considered Basket Maker III in type of culture--Hall 1944, 29), and two of the three extended inhumations (as against 21 flexed) at Mesa Verde Site 34 were face down--but with ankles crossed, and with no offerings (O'Bryan 1950, 77-78). Other instances of burial face-down in the southwest are flexed; extended pronation is known only from central California and Bronze Age China (Heizer and Fenega 1939; Li Chi, 1943).

Flexure is characteristic also of the Mimbres, and of early Mogollon sites as far north as Forestdale. In contrast, fully extended inhumation is overwhelmingly predominant, along with the rectangular kiva, oxidized pottery, and the three-quarter-grooved axe--traits also characterizing the Mimbres--in the developed and late culture of the western districts of the Pueblo area, including the Cibola group in the White Mountains, the Sinagua of the Flagstaff district and the Verde Valley, the Prescott complex, the so-called Salado of the Tonto Basin and the so-called Salado horizon of the Hohokam area.

The earliest individual instances so far recorded, however, at sites with mainly flexed burials, are either the first Anasazi occurrence, the Basket Maker III cases on the La Plata (Morris 1939, 56, 73), or (more probably) the extended inhumation at the SU site near Reserve, New Mexico (Martin 1943, 250-251).

Continuity of Anasazi Population

The two Mancos Canyon adult specimens whose cranial measurements are given by T.D. Stewart in Appendix B are, respectively, Basket Maker III, undeformed and dolichocephalic, and Pueblo I, artificially deformed and, consequently, brachycephalic. Yet the nasal and orbital measurements, which are least affected by deformation of the back of the head, are very close to each other and to the means previously published by Stewart for the Anasazi generally (Stewart 1940 in Roberts 1940). The possibility is suggested that the same people lived in Mancos Canyon throughout, practicing cranial deformation after the fifth century and thus masking their natural dolichocephaly.

In the 1890's the Wetherills recognized not only distinctions in culture between the early Basket Makers and the overlying so-called Cliff Dweller remains, but also the difference in the skeletal remains (Kidder 1924, 46, 77; Morris 1939, 11-12)--

undeformed dolichocephals underlying artificially deformed brachycephalic Pueblo skulls. Ever since, this distinction has often been taken to indicate the irruption of a new ethnic element at the end of Basket Maker III: the arrival of brachycephals bringing only the bow, possibly the stone axe, and great capacity for cultural development (for example Roberts 1929-1939; Hooton 1930, 355-357; Morris 1939, 20, 29,43, 247). To this list would, of course, be added the cultural trait of cranial deformation. The populations were described as quite different: small, slightly built, non-mongoloid Basket Makers akin to the widespread early dolichocephals; and stocky, sturdy Pueblos of the later, more mongoloid, broadheaded immigration.

The postulated newcomers have generally been thought of as coming from the north or northeast, the Great Basin, or the Great Plains. The bow and axe suggest a warlike hunting people who would have little else new to contribute.

Actually, the use of the bow is indicated for the period known as Basket Maker III. There is a little evidence for yet earlier presence of the bow in the Southwest, though possibly not among the Anasazi (Morris 1939, 19; Gladwin et al. 1937, 109, 111). The stone axe of the Anasazi, not a hunting or fighting weapon (Morris 1939, 147), probably is a poor imitation of the excellent basalt axes of Sonora, the Hohokam, and the central Arizona pueblos.

Recently the opposite idea has been suggested, that the brachycephals were actually the culture carriers, coming from the east or south, bringing advanced culture to the Southwest but with many traits diffusing ahead of them to the benighted aborigines. This hypothesis, perhaps more reasonable from a general viewpoint, is supported by the occurrence of brachycranial skulls in early Mogollon sites, at least some of which probably antedate Pueblo I (Martin 1940). This could be accepted along with either a Mogollon-Plains connection (Haury 1936a), a Mogollon-Mexico connection (see Reed 1942), or a postulated so-called Cordilleran complex of advanced culture and brachycephalic people coming directly and rapidly from Asia (Gladwin 1937).

Lately a still different suggestion has been advanced, that no such immigration occurred at all, but that instead the same population occupied the northern Southwest continuously, one of the culture traits which diffused into the Anasazi area after A. D. 700 being the practice of cranial deformation, which changed the apparent head form (Seltzer 1936).

In support of this view, the virtual identity in various Southwestern skeletal series, deformed and undeformed, of those facial measurements least affected by deformation has been pointed out by Stewart (1940, in Roberts 1940). Comparison of these with the same measurements for series from other areas, Californian and eastern, indicates that this is probably a genuine unity, not due to similar closeness of these measurements in American Indians in general.

Undeformed skulls from late sites such as Pecos and Hawikuh are virtually indistinguishable from Basket Maker skulls; and it has recently been convincingly demonstrated that the supposed difference between slenderly-built long-headed Basket Makers and sturdy so-colled mongoloid, brachycephalic Pueblos is largely imaginary (Seltzer 1944; and George Woodbury, summarized and quoted in Brew 1946, 69-70).

The supposed occurrences of deformed dolichocephals and undeformed brachycephals in the Anasazi area have been reported by archeologists from field observations without benefit of study by a physical anthropologist; and the range of the Basket Maker index actually extends up to include mesocephals and even low brachycephals. The early Mogollon brachycephals "show slight deformation" (Haury 1936a, 113; Martin 1940, 91; Martin 1943, 250).

Continuity of Anasazi population accords better with the smooth though rapid development of Anasazi culture from initial Basket Maker III onward, obviously occurring under strong influence from outside the San Juan area, but so continuous and so distinctive a sequence that stimulus diffusion rather than immigration of culture bringers is indicated.

A combination of the two hypotheses is, of course, possible, and might be the most reasonable and conservative view, as a working concept. That is, one may suppose that brown ware and pit houses and other relatively advanced traits were brought into the southern part of the Southwest by brachycephalic immigrants; that these traits spread to the Anasazi Basket Makers, in greatly modified form, largely through stimulus diffusion; that small numbers of brachycephals also came north in person; and that a predominantly dolichocephalic population with only slight admixture was masked by the practice of cranial deformation.

That the lambdoid variety of cranial deformation in the Southwest is the natural type instead of artificial, due to mixture between peoples with long and broad skulls, has been suggested (Hooton 1930, 38). It is obviously artificial, however, and quite different from the natural lambdoid flattening (see Neumann 1942, 308), which does also occur in the Southwest (for example, Fig. 62, lowest figure, in T. D. Stewart's report herewith). Confusion might have been avoided by the use of a different term, such as, perhaps, "obelionic flattening," for one or the other.

That true lambdoid deformation is of artificial origin is conclusively shown by its asymmetric occurrence, something which could scarcely be produced by the most reprehensible miscegenation. Numerous cases of asymmetric lambdoid deformation have come to my attention. Three, for instance, are from the centre and either extreme of the Anasazi area: Skull L 50/75 at the Laboratory of Anthropology, from a Pueblo II site in the Tesuque Valley just north of Santa Fe; Skull BP 6470 in the National Park Service Museum collection at Boulder City, Nevada, from a rock shelter in the Moapa

Valley-Lake Mead area; and the first skull ever published from Chaco Canyon, found at a depth of 14 ft. in the channel bank near Pueblo del Arroyo by W.H. Jackson in 1877 (Hoffman 1878, 454-455, Pl. LXXV).

The etiology of artificial lambdoid cranial deformation is indicated by the contrast between a Basket Maker II cradle from White Dog Cave (Guernsey and Kidder 1921, 54, Pl. 4) and a Pueblo III cradle from the Tsegi-otsosi (Guernsey 1931, 105-106, Pl. 64). In the first, the baby, wrapped in square blankets of woven yucca fibre cloth and of rabbit fur string, is simply lashed to an oval frame with 50 transverse twigs. Other less complete rigid cradles from White Dog Cave are similar, with the addition of longitudinal as well as transverse willow twigs. Flexible cradles of yucca leaves with an oval rim of grass or cedarbark are also found in Basket Maker II (Kidder and Guernsey 1919, 165-166).

The Pueblo III cradle, as well as an 8 inch bark hood and other additions and details, contains as an accessory a wooden headboard 6 3/4 in. by 4 1/2 in. thick, evidently wedge shaped. As has been pointed out by others (McGregor 1941a, 231), cranial deformation is undoubtedly caused by this hard headrest. The prediction may be ventured that Pueblo I cradles will be found which have this feature, but no Basket Maker III instances. Pueblo I cradle types apparently are not known; Basket Maker III cradles are stated to be like those of Basket Maker II (McGregor 1941a, 213, 263, 286; Morris 1939, 29).

In addition, wooden pillows are found in cliff dwellings, the name and function of these billets of cottonwood being indicated by the finding of one in place in the walled-up burial at Poncho House (Guernsey 1931, 107. See McGregor 1941a, 263-264). Guernsey suggests in this connection, ". . .it seems probable that a habit acquired in infancy might continue through adult life."

Lambdoid Deformation As a Cultural Diagnostic

The lambdoid type of artificial flattening constitutes a cultural trait of some significance in space as well as time. It is evidently as distinctively characteristic of the Anasazi culture of the upper San Juan as are the circular kiva, gray ware and black-on-white pottery, and certain other traits. Whether it, like these traits, applies also to the western San Juan, is not definitely known.

Lambdoid deformation is characteristic of both Chaco-Mancos and Mesa Verde periods, found on Alkali Ridge (Brew 1946) and Squaw Point Mesa (Prudden 1918, Fig. 8) and at Lowry (Stewart 1937; von Bonin 1936, 1937); it occurs in the Mesa Verde (Retzius in Nordenskiold 1893, ix-x Pl. II-VIII, X), though not to the exclusion of the vertical occipital type (Nordenskiold 1893, Pl. XVIII: 2a, Retzius Pl. I and IX); and also in the Mancos Canyon excavations here being reported; it occurs in the Largo phase (roughly, Pueblo III) of the Gallina area (unpublished skulls at the Laboratory of Anthropology, Santa Fe; Gabel in Hall 1944); at Chaco Canyon sites (Stewart 1940,

in Roberts 1940; and skulls from Bc 51 and other sites which I have at hand /1951/ or have previously seen); and at Allantown on the Puerco River in Arizona (Stewart 1940, in Roberts 1940). Skulls from the most westerly Anasazi are not adequately reported, but lambdoid deformation is surprisingly well represented at Winona and Ridge Ruin, near Flagstaff (Bartlett in McGregor 1941a). These are primarily Sinagua sites (western Mogollon), but strongly influenced by adjacent Anasazi. Interestingly enough, lambdoid flattening seems to correlate with flexed inhumation in the Flagstaff area. Both are San Juan Anasazi traits, and contrast with typical Sinagua extended burials with vertical occipital deformation. Otherwise, vertical occipital deformation seems to be characteristic of western and southern Pueblo districts, from the fifth century to the fifteenth (Reed 1949a).

Undeformed skulls are general in late Basket Maker III--in early Pueblo I remains of the eighth century, and even into the ninth, such as the Rosa phase in the Governador area (Gabel in Hall 1944) and the related Pueblo I remains on the Piedra (see Stewart's report herein, Appendix B). The only undeformed specimen in the small Mancos Canyon series is the Basket Maker III female, probably of the seventh century. The extended infant burial, 11/3, is one of the earliest occurrences so far reported of definite lambdoid deformation.

The statement or theory of Richard Wetherill that skulls from mesa top ruins are lambdoidally deformed, skulls from the cliff dwellings occipitally (Nordenskiold 1893, 76), might refer to undeformed skulls with natural lambdoid flattening, from Basket Maker III sites on the mesas. However, an old photograph in the Laboratory of Anthropology print file, catalog No. 70/505, ". . .taken by a member of the Nordenskiold expedition about 1890," shows an apparently undeformed and dolichocephalic skull labeled "cave-dweller" (Basket Maker?), a skull showing clear artificial lambdoid deformation, possibly asymmetric, labelled "mound-builder" (which could refer to Pueblo I open sites), and one with vertical occipital deformation labelled "cliff-dweller"(that is, Classic period). On the other hand, skulls with the lambdoid type of deformation do also occur in the cliff dwellings in contexts of the Mesa Verde period. The skulls from Mesa Verde Site 34 are listed by O'Bryan (1950) as lambdoidally deformed. Actually, however, those saved show vertical occipital deformation in three cases, against eight lambdoid. Incidentally, it is of interest that deformed skulls from burials excavated in 1949 and 1950 by Charlie R. Steen of the National Park Service at Tsetaa in Canyon de Chelly include seven vertical occipital and only three lambdoid.

CHAPTER V

POTTERY

Classification

The prehistoric pottery found in southwesternmost Colorado is of several sorts. Some are believed to be of local manufacture and other, of less frequent occurrence, evidently were imported by trade from other areas of the Southwest where they are more abundant. The locally-made pottery consists of black-on-white painted ware and rough unpolished gray utility or culinary ware, plain or texturally ornamented by so-called corrugation or some other technique. These two wares are represented, in one form or another, and predominant, at every Anasazi site in the region.

The so-called intrusive pottery, types thought to have been imported by trade, occur much less consistently and abundantly. The intrusive pottery includes gray and black-on-white specimens, recognizably different from the local ware and of types known to be indigenous, or at least abundant, in neighboring areas in northwestern New Mexico and northeastern Arizona; and brown, orange, and red pottery.

Most of the orange pottery and black-on-red is of a single major group or ware, known to be indigenous to southeastern Utah in early times and to northeastern Arizona in later periods, and thought by some archeologists to have been manufactured also in southwestern Colorado in early periods rather than imported. This so-called San Juan Orange Ware is discussed at some length below.

There occur also specimens of black-on-red, polychromes combining white with black-on-red, and unpainted brown types, undoubtedly traded from the forested mountain zone of eastern central Arizona, and of Mogollon affiliation or derivation.

All these sorts of pottery, although not all the varieties which have been found in southwestern Colorado, are represented, if only by a few sherds, in the material from the 1942 excavations in Mancos Canyon.

Some general problems of classification

The scientific method, the essence of which is critical open-mindedness, willingness to examine without prejudice new hypotheses, new techniques, and new terminologies, may be summarized as (1) collection of data, (2) classification of data, (3) interpretation of data. (The fourth step, verification of hypotheses by experiment, is seldom feasible in the social sciences.) The making of valid inferences and the setting forth of reasonable hypotheses is possible only after classification and study of data.

In the Southwest, pottery is the category of archeological material requiring the most study and offering the most reward for study. Implements and architecture are classifiable, and useful for analysis and interpretation of Southwestern prehistory, only in a more general way. Southwestern pottery is readily divisible into groups and subgroups, which can be localized in time and space. Full utilization of pottery in Southwestern archeological studies requires subdivision or grouping into specific varieties, as localized as possible in time and place of manufacture, as well as observation and description of features of shape and decoration of individual specimens.

These varieties must be distinguished partly on the basis of technical details, as ceramic shapes in the Southwest are not greatly varied, and as similar styles and elements of design occur over wide areas and long periods on quite distinct sorts of pottery. Increased interest in archeological surveys in the use of potsherds, from which forms and designs cannot always be determined, fortunately has led to emphasis on technical ceramic details of materials and manufacturing processes.

Classification implies and requires terminology, and classification of Southwestern pottery has gradually developed from broad separation of black-on-white, polychrome, corrugated, etc., or ancient ware, transitional ware, modern ware, through less general but unsystematized terms such as Chevlon Ware, proto-Kayenta, Jeddito Yellow Ware, Little Colorado Red, to a well organized taxonomy (Colton and Hargrave 1937; Colton 1941).

In this connection, the following apposite quotation is introduced from an article concerned with biological science:

> "Any form of organized knowledge, taxonomy not excluded, is by its nature progressive, or should at least strive to be progressive. Thus the names which a form of organized knowledge uses at any given stage of its evolution and development merely cloak certain concepts which are then current. It is manifest that changes in concepts cannot take place without changes in names . . . Against hopes and attempts to seek certainty in science, be this certainty and its attending stability in the field of concepts or of names, must be stated aloud the truth that science is knowledge in organized evolution and part of man's live experience" (Croizat 1941, 109-110).

Specific unitary groups of pottery specimens sharing style of design and all essentials of material and treatment, but varying in shape and decoration and perhaps in some technological features, are called "types" and assigned identifying names such as "Mesa Verde Black-on-white." This name, properly used, does not mean any and all black-on-white pottery found on the Mesa Verde, but refers to a distinctive sort of pottery which is found on the Mesa Verde and in a great many other places, associated with other types of black-on-white. The geographic part of the binomial

need not be the place of actual manufacture or center of distribution, though it preferably should be when possible; it serves mainly as an identifying label among black-on-white types, or polychromes or corrugated, and only secondarily indicates the region of occurrence (Colton and Hargrave 1937, 20).

The question whether a so-called type is the actual material group of objects, or is an abstract philosophical concept, an ideal to which the artifacts approximate in varying degree (Rouse 1939, 11), strikes me as a highly academic argument. The compromise approach of defining the type by a selected individual specimen, to which others correspond more or less closely (Rouse 1941, 25-149), seems unsatisfactory, although I believe it is the standard method of palaeontology. I prefer to think of the word "type" in this connection as having a concrete meaning and denoting all existing artifacts, both known and unexcavated, which are approximately or nearly identical in certain essential characteristics.

The type description is then in effect an average, which may or may not correspond precisely to any individual specimens. An advantage of this approach is that the description can be revised with less mental adjustment, as the aggregate of known specimens increases and/or is more thoroughly studied; whereas if the type is set up as an ideal concept, or on the basis of a particular specimen, additional specimens must conform pretty exactly or be separately classified.

This definition or conception follows the eminent Russian archeologist V. A. Gorodzov: "At the basis of this classification is placed the type which is understood as a collection of objects similar in function, material and form (Gorodzov 1933, 98).

There has been an exactly similar difference in attitude among biologists:

> "To Darwin, species were abstract things, the temporary phases or manifestations of a continuous series. . . . To Agassiz, on the other hand, a species was a concrete entity, in the sense that it was the sum total of all the individuals descended from an original pair. . . . it might almost be said that Agassiz and his school sought to discover species; the evolutionist made them" (Mead 1939, 244).

Admittedly, classification and taxonomy can be carried too far. The development of ceramics, or any other handicraft or art, is a continuous process, with transitions between definable stages and with hybrids between contemporaneous varieties; pottery vessels were made by human individuals--and not only that, presumably by female humans--each of whom might have slightly different ideas. The conservative opponents of thorough classification laboriously point out this obvious fact, with the corollary that every single piece of pottery could be separately typed.

Nevertheless, the actual fact is that the overwhelming majority of Southwestern pottery can readily be classified into recognizable types, and the so-called hybrids and transitions and individual aberrations are in the minority. There is no reason why these latter cannot be described as such, without affecting the validity of the established system for major types.

Types which differ from each other only in style of design and perhaps in minor details such as the shaping of vessel rims, or which differ to some extent in temper or surface treatment but are equally clearly parts of a single development, are grouped together as a "series" (Colton and Hargrave 1937, 3). Quite often this intermediate classification can be omitted, and related types lumped under the main heading of "ware."

A ware, in Southwestern ceramic taxonomy, comprises pottery all of which is constructed, thinned, ornamented, and fired in the same way, and distinctively unified further by one or more specific characteristics; for example, coiled, paddled, painted, well oxidized, unpolished; or coiled, scraped, unornamented or coil ornamented, reduced, sand tempered; or coiled, scraped, painted, reduced, with iron paint. Wares are theoretical entities comprising groups of actual specimens designated as types; since a ware is thus defined (Colton and Hargrave 1937, 3), perhaps I cannot insist on a concrete referent. The proper allocation to a ware of a given type may even be doubtful (for example, Colton 1941, 30).

If the taxonomic system had been built down from the largest grouping, instead of starting with types and building up, it might be possible to argue that ware means an aggregate of real objects, divided into subclasses, rather than a rather vague referent consisting of types which are already more or less abstracted. In any case, one advantage of categorizing and naming the larger groupings is that sherds or vessels of uncertain type can usually be placed in the proper ware. The word "ware" can also still be used broadly as in "utility ware."

Classification of the pottery of Southwestern Colorado

The pottery of southwestern Colorado, and specifically that from the Mancos Canyon work of 1942, can be classified, according to the system that has been outlined, into groups, described further on, that have been named by various archeologists as follows (the names marked with an asterisk have not previously appeared in print, although none except a few group names are of my own devising):

1. Local painted pottery types, white ware, early to late:

La Plata Black-on-white, basic to all eastern Anasazi Black-on-white series.
*Animas series of Cibola White Ware:
Piedra Black-on-white
Mancos Black-on-white

Mesa Verde White Ware
"McElmo Black-on-white" (see discussion below)
Mesa Verde Black-on-white

2. Local gray ware (utility or culinary pottery). Successive types, styles, or stages:

Plain Gray (affinis Lino Gray)
Coil necks:
Banded-neck Gray (equivalent of Kana-a Gray)
Indented-corrugated Necks (paralleling Medicine Gray)
All over-corrugated (equivalent of Tusayan Corrugated and Little Colorado Corrugated):
Variable Corrugated
Standardized Corrugated

3. *Rosa Gray Ware (gray pottery with distinctive paste, indigenous in the Gobernador area 75 miles to the southeast, probably intrusive in Mancos drainage, comprising the following roughly contemporaneous types sparsely represented in Mancos Canyon):

Rosa Smoothed
*Rosa Banded-neck
Rosa Black-on-gray

4. San Juan Orange Ware (orange and red pottery of southeastern Utah and northeastern Arizona; late types certainly intrusive in southwestern Colorado and early types probably; ware combining three groups, successive in time, whose relationship and continuity have not always been recognized):

a) *Alkali series of southeastern Utah in Basket Maker III-Pueblo I, fairly well represented in Mancos Canyon sites:
Abajo Red-on-orange (Abajo Polychrome has not been found in Mancos Canyon)
La Plata Black-on-orange
Unnamed minor subtypes
Bluff Black-on-red

b) Deadmans series (San Juan Red Ware), of northeastern Arizona and the Flagstaff district; probably to be separated, primarily on the basis of temper, into two localized parallel series:
Deadmans Black-on-red (whether it is represented in Mancos Canyon depends on definition of the type; see below)
Tusayan Black-on-red (represented at Site 1, and by one sherd at Site 4)
Citadel Polychrome (three sherds from Site 1)

c) *Tsegi series, so-called Tsegi Orange Ware, of northeastern Arizona in Pueblo III, Tusayan Polychrome and related types and subtypes, not found in Mancos Canyon work.

5. Miscellaneous intrusive types, definitely imports:

Sosi Black-on-white (from northeastern Arizona, Tusayan White Ware), one sherd at Site 1

(Black Mesa Black-on-white, antecessor of Sosi, not found; represented on the La Plata and at Lowry /Morris 1939, 203, Pl. 288:3, a-d, 296:a; Martin 1936, 80/)

Chaco 3 Black-on-white (northwestern New Mexico, so-called Cibola White Ware) at Site 1

Chaco 2 Black-on-white (northwestern New Mexico, also called Cibola White Ware) quite possibly represented, difficult to distinguish absolutely from Mancos (see discussion below)

Wingate Black-on-red (White Mountain Red Ware, from the region of east-central Arizona), at Sites 1 and 18

Querino Polychrome (a development of Wingate), one sherd from Site 18

Uncertain type, affinis Clear Creek Brown, of Alameda Brown Ware (paddle-and-anvil; undecorated utility ware, central Arizona and the Flagstaff area), fragmentary vessel from Site 1

Unnamed type of Mogollon Brown Ware, polished brown corrugated probably belonging in the Showlow series, unquestionably from the general White Mountains region, one sherd at Site 1. (Additional types of black-on-red, polychrome, and polished brown or red found in other districts of southwestern Colorado; see below)

Rearrangement of the types listed under local white ware and gray ware according to known general period gives the following:

Basket Maker III:
La Plata Black-on-white, plain gray

Pueblo I:
Piedra Black-on-white, banded-neck gray

Pueblo II or III-A, Chaco period:
Mancos Black-on-white, variable-corrugated

Pueblo III, Mesa Verde period:
Mesa Verde Black-on-white, standardized-corrugated

There is overlapping, of course, particularly of plain gray into Pueblo I and even into Mancos times, and of variable-corrugated into Mesa Verde times.

The so-called intrusives seem to be distributed as follows:

Basket Maker III:
Abajo Red-on-orange

Pueblo I:
Abajo Red-on-orange, La plata Black-on-orange, Bluff Black-on-red; Rosa Gray Ware

Pueblo II (Mancos period):
Alkali series as above; plus Tusayan Black-on-red; also Wingate Black-on-red, polished brown ware types; Citadel Polychrome, Sosi Black-on-white, and Chaco 3, all of the first half of the twelfth century, found at Site 1 with Mancos and so-called McElmo Black-on-white.

Pueblo III (Mesa Verde):
Intrusives very rare; none in Mancos Canyon sites demonstrable of the Mesa Verde period, St. Johns Polychrome and other late types found sparsely in adjoining districts (Reed 1944c)

White Ware

La Plata Black-on-white

The pottery of the slab-lined structures at Site 3 and similar early structures elsewhere in the region consists of coarse plain gray and black-on-gray. The period of cultural complex they denote is called Basket Maker III or Modified Basket Maker, and has been found by tree-ring studies to extend from before A. D. 450 to about A. D. 750.

The plain gray ware is discussed in the next section. The scarcer decorated pottery is represented in the Mancos Canyon excavations by a small number of bowl sherds and one restorable bowl (Specimen 3/4). The paint seems to be iron; if this is correct, the material may be referred to the established type La Plata Black-on-white, the eastern or Chacoan form of Basket Maker III painted pottery, as against the western, carbon paint type called Lino Black-on-gray. In his report on 1947-48 excavations in the Mesa Verde, O'Bryan (1950) sets up a new type, which he calls "Twin Trees Black-on-white," on the basis of sand temper, with fine-grained, rather soft paste, high polish, and designs the same as Lino, but in mineral paint. Inasmuch as La Plata normally is rock-tempered and not highly polished, this would appear to be a valid distinct type. In practice, however, it is quite difficult to assign sherds to one type or the other. Pottery of the sand-tempered Twin Trees variety, and some of the rock-tempered La Plata, is well polished only in comparison to the unpolished or poorly polished contemporaneous material, not really so-called highly polished; and much Basket Maker III black-on-white pottery is partly or semi-polished. Kind of temper (and of paint) would seem to provide the only consistent basis; thus:

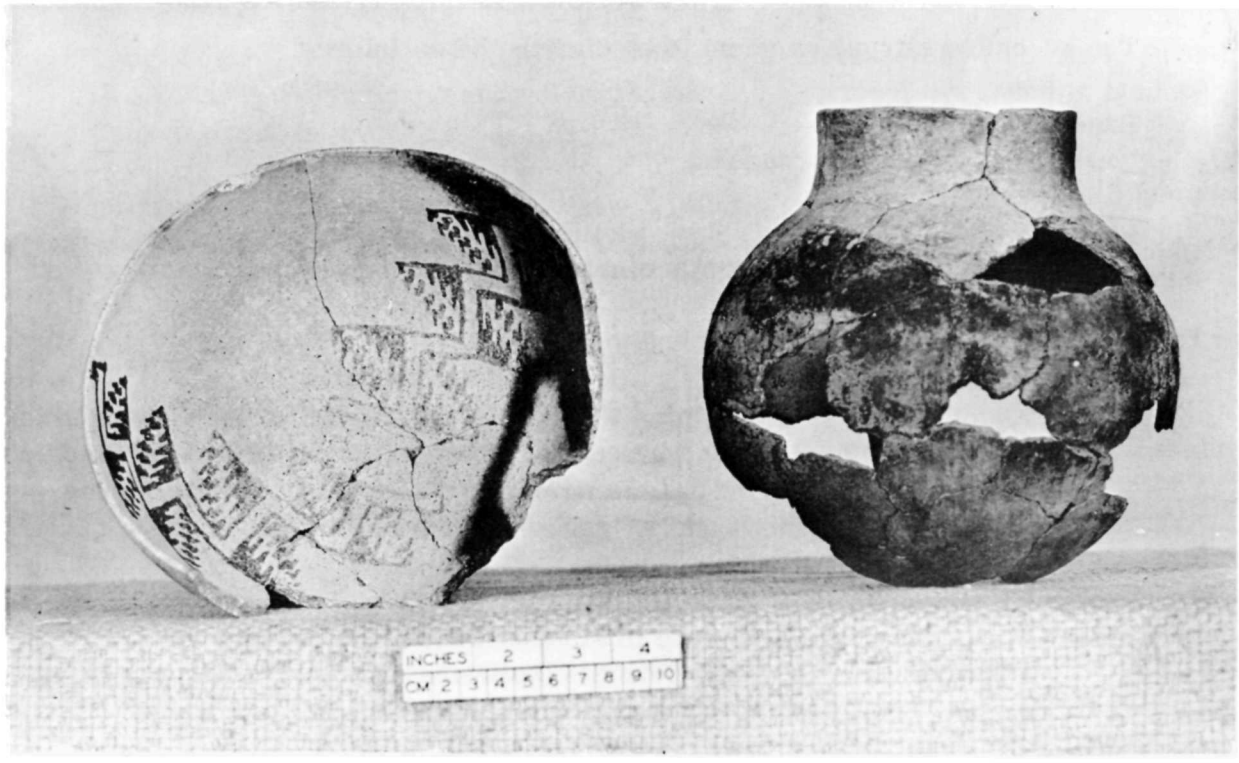


Fig. 35. Left, La Plata Black-on-white Bowl 3/4. Right, Plain Gray Jar 3/6.

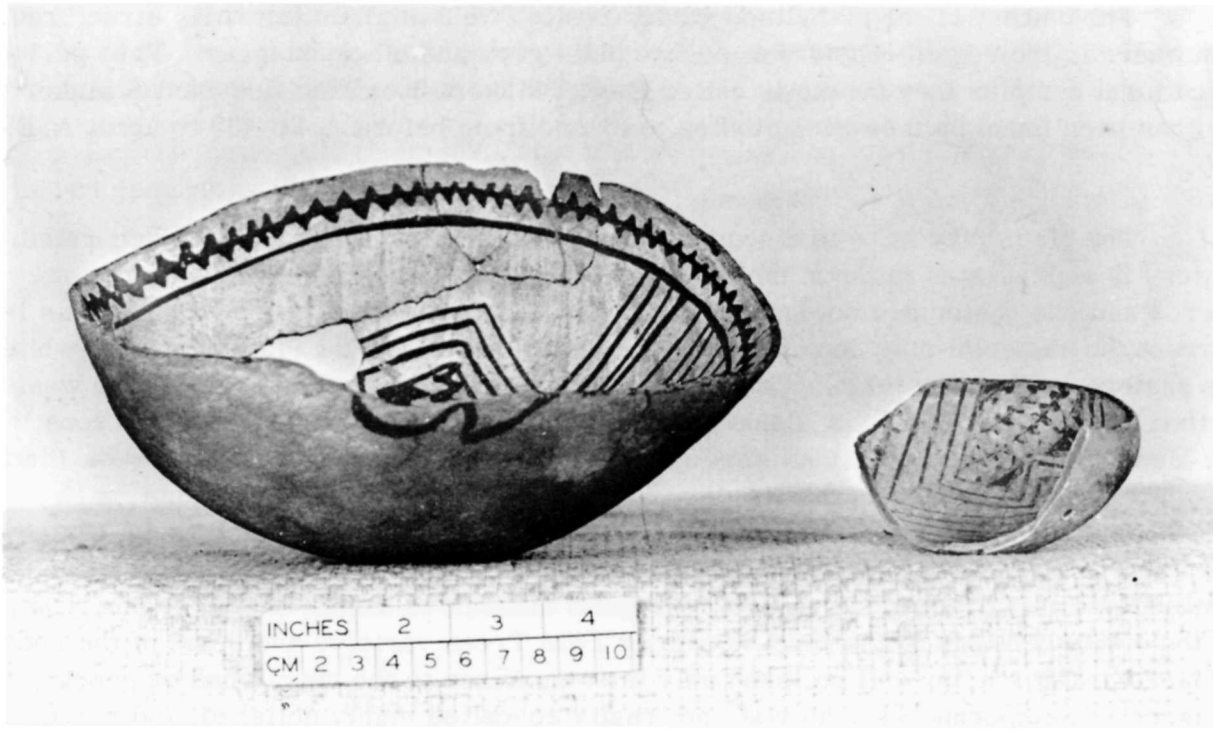


Fig. 36. Piedra Black-on-white bowls found with Burial 2 at Site 2.

	Iron	Organic Paint
sand temper	Twin Trees	Lino
rock temper	La Plata	?

The paint ranges from gray-black to soft red-brown (see remarks on reduced firing below). No glazed-paint specimens were found. The unslipped surface ranges in quality of finish from partly polished to rougher than much of the plain gray, and is nearly white in some specimens, definitely gray in others. Bowl rims are simple, direct, and rounded. Forms other than hemispherical bowls are not represented in the small collection.

The restorable bowl of La Plata Black-on-white, a stray find in the area between the slab cists and the main part of Site 3, with no specific association, is of interest in the way the design uses small repeated elements with stepped lines, an unusual combination of common motifs (Fig. 35, a). Otherwise, the sherds of this type from Site 3 and the few from other sites exhibit the usual range of Basket Maker III design (see Morris 1939, 153-155, Pl. 199-207). Bowl 3/4 has faint traces of fugitive red on the exterior, as do a number of the sherds. The bowl is 205 mm. (8 in.) in external diameter, and 98 mm. (3-7/8 in.) in height or external depth, with walls 6 mm. -7mm. thick (1/4 in.). The interior is smooth but unpolished; the exterior bears streaks of polishing or wiping and marks of scraping.

Here, as on the La Plata (Morris 1939, 267) and at Shabikeshchee in Chaco Canyon (Morris 1939, 277), the decorated Basket Maker III pottery is tempered with igneous rock (examination with binocular microscope, checked and confirmed by Stanley Stubbs). The rather sketchy published description of La Plata Black-on-white gives coarse sand as the tempering material, and further states ". . . same as Lino Black-on-gray except for paint type" (Hawley 1936, 23). Presumably this is incorrect. Inasmuch as Miss Shepard finds the rock-tempered La Plata valley pottery to include organic paint as well as mineral (Morris 1939, 267), it may be that Lino is in part rock tempered.

On Alkali Ridge both iron paint (La Plata) and organic paint (Lino), with the former predominant, were found in relatively small quantity by Brew; temper and surface finish are not discussed (Brew 1946, 259).

The statement that this pottery is unpolished (for example, Hawley 1936) is not entirely correct, as some of it is fairly well smoothed (more so than most western Lino, I should say), the strokes of a pebble or other tool being recognizable; more accurate is ". . . rubbed. . . but lacking the careful polish characteristic of later periods" (Roberts 1929-1939).

Colton has set up a "Cibola White Ware" to include Chacoan, eastern Anasazi, iron paint types (Colton 1941, 55-56). The name is perhaps ill chosen, as Gladwin's

"Cibola Branch" is something quite different (Gladwin 1934, Fig. 3). La Plata Black-on-white is placed in a "Puerco Series" of this ware, a series which is otherwise a localized sequence in the Puerco district. La Plata Black-on-white is equally basic to the Chaco series and others, and it cannot be placed in only the Puerco series. Nor can it be placed in any one series of the Chaco area, the Mesa Verde area, or the Rio Grande.

Colton solved or evaded this difficulty in the case of Lino Black-on-gray by classing it as gray ware instead of white ware. Admittedly, it is simply Lino Gray with decoration added; and I am doing the same thing with Rosa Black-on-gray in this paper. Yet Lino and La Plata are not mere aberrants of the utility wares; they are the basic types from which later painted types are derived.

The only solution I see is to admit they are basic types that cannot be assigned to series, thus:

Ware: Tusayan White Ware (Cibola White Ware).
Basic type: Lino Black-on-gray (La Plata Black-on-white).
Series: Polacca series, etc. (Puerco series, etc.).

Piedra Black-on-white

The black-on-white of Pueblo I style from Site 11 and from sherd areas, and found as occasional holdovers at other sites, is closely similar to Piedra Black-on-white (Roberts 1930; Mera 1935,2), as is the case on the La Plata (Morris 1939, 31), though some of it approaches normal Chaco I (see Fig. 36). It is all iron paint; no sherds of western Pueblo I, the distinctive type Kana-a Black-on-white, with carbon paint, are present. Kana-a Black-on-white is not uncommon at Chaco Canyon, however (sherds from the west plaza of Pueblo Bonito, collected by R.G. Vivian in 1941; Brand et al. 1937, 86).

Simple rectilinear designs predominate. Thin parallel straight lines, wavy lines, lines with a wavy line drawn along each squiggled hachure, crudely-done solid triangles with or without hooks, crude scrolls, large irregular solid dots, and a few checkerboards, make up a design system similar to that of Pueblo I on the Piedra, Animas, and La Plata, and that of a large portion of Chaco I. Pueblo I material from the Ackmen-Lowry district is similar (Martin 1938, Pl. CL; Martin 1936, Pl. CIX).

The term Piedra Black-on-white has erroneously been thought to refer to a Rio Grande variant of eastern Pueblo I black-on-white (Hawley 1936, quoted by Brew 1946, 253). This was never the intention.

The characteristic sloppily-applied white slip of Chaco I is rare, although present on two of the three more or less complete specimens from Site 11 (18 and 19).

The surfaces are generally unslipped light gray, very smooth. Bowl exteriors are occasionally unpolished. Temper, as in the Piedra (Roberts 1930, 80) and La Plata (Morris 1939, 269) districts, consists of crushed rock, as in the preceding horizon. Mica, quartz, and other light colored material, as well as dark igneous rock, were recognized in bits of Pueblo I painted ware from Site 11 studied under the binocular microscope.

Sufficient material is available to permit an attempt at formal description of this type:

Piedra Black-on-white.

Synonyms: Pueblo I Black-on-white (Roberts, 1930; Morris 1939); Mancos Black-on-white, in part (Martin 1939, 463).

Described: Roberts 1930, 80 ff.; Morris 1939, 160-179 and Shepard in Morris 1939, 269.

Named by: Mera 1935, .

Illustrations: Roberts 1930, Pl. 25-31; Morris 1939, Pl. 226, 237-240, 246-254, and 263-268; Martin 1936, Pl. CIX; Martin 1938, Pl. CXLIX, CL.

Stage: Pueblo I.

Time: About A.D. 750 to perhaps A.D. 900.

Description:

Constructed: by coiling.

Thinned: by scraping.

Firing: so-called reduced.

Core: light gray.

Carbon streak: occasional.

Temper: crushed igneous rock.

Texture: medium.

Fracture: somewhat crumbling.

Surface finish: smooth, fairly well polished, mostly unslipped--a thin even slip on 27-47% in La Plata collections, 46% on the Piedra, much less on the lower Mancos.

Surface Color: generally pale gray, sometimes white.

Fireclouds: uncommon.

Forms: bowls, half-gourd ladles, jars, pitchers, seed jars, effigies and unusual forms (see Roberts, 1930, Fig. 19).

At Site 11 in Mancos Canyon, 115 bowl sherds; 10 half-gourd ladles represented, 1 bowl-and-handle ladle; 1 seed-jar rim, two vertical necks of globular jars and 35 other jar sherds; one sherd apparently from the handle portion of a gourd-shaped pitcher. Effigies and eccentrics not represented (Morris 1939, Pl. 230-236, 240).

Thickness of vessel walls: 2.5 mm. to 7 mm., generally close to 5 mm.

Bowl rims: simple and direct, generally rounded and slightly tapered, slightly beveled from the outside, rarely tapered and squared, possibly always painted.

Paint: iron, reddish to black, generally brownish gray, thin.

Designs: mostly simple and crudely executed; straight narrow lines, wavy lines, straight lines overlain by wavy lines, squiggled hachure, solid triangles, with or without pendent dots or hooks, simple scrolls, checkerboards, large irregular dots.

Draftsmanship: generally poor.

Comparisons: Chaco 1, characteristic white slip, sand temper reported (not checked), less friable, generally finer textured and harder paste. Kiatuthlanna, white surface, sand temper (not checked), distinctive design system, texture like Chaco 1. Kana-a, carbon paint, sand temper, similar but distinct style of design. Mancos, sherd temper, hachure-filled designs and large solid designs, generally thicker walls.

Range: Mesa Verde area of the northeastern San Juan (Piedra, Animas, La Plata, and Mancos drainages; probably also the Hovenweep drainage). Present at Chaco Canyon, possibly of local manufacture there as one extreme of the Chaco 1 range (sherds from Pueblo Bonito, west plaza, collected by Vivian, 1941). Missing in the Montezuma Creek drainage of southeastern Utah where the decorated pottery of Pueblo I is red-on-orange--only one sherd of Pueblo I black-on-white, very similar to Chaco 1, found on Alkali Ridge (Brew 1946, 253 and Fig. 135).

Remarks: Piedra Black-on-white with unobliterated-coil exterior (bowls), slipped, coils emphasized by tooling, occurs, though rarely (one sherd from Site 7, well made; one from Site 24, the coils smeared; probably Pl. 284:d in Morris 1939).

Two bowl sherds of Piedra black-on-white from Site 11 bear exterior decoration as well as interior; one a single carelessly-drawn vertical line on the exterior and a squiggled hachure decoration on the interior (see Roberts 1930, Pl. 31), the other a relatively complicated arrangement of heavy lines (see Fig. 44, top; interior decoration, typical waved lines).

One ladle handle from Site 11, solid, flat strap, welded (applied) is the exception to the prevalence of half-gourd ladles (see Nordenskiold 1893, Pl. XXX: 4; Morris 1939, Pl. 238-239; Roberts 1930, 101). There is one solid vertical handle of circular section (pitcher), and one jar sherd with the socket of a welded horizontal handle. A riveted (inserted) jar handle, solid, of circular section, from Site 4 is of a vessel typologically Piedra, squiggled-hachure style.

Mancos Black-on-white

The Pueblo I painted ware of the northeastern San Juan, which has been designated Piedra Black-on-white, deviates from typical Chaco 1 in the direction of Mancos Black-on-white of the Early Classic period. Occasional sherds are difficult to place definitely between Piedra and Mancos, and a distinctive group decorated in squiggled hachure seems to be transitional. Separation of Pueblo I (Piedra) and Mancos is, however, entirely practicable and definitely desirable, though it has not always been done (Martin 1938, 1939).

The term "Mancos Black-on-white" is a rather general one, referring to pottery of southwestern Colorado intermediate in type and time between Piedra and Mesa Verde, unified in some traits and varying considerably in others. The wide range of design can be seen in the published description and illustrations (Martin 1936); the finish and technique likewise vary considerably. Yet formal subdivision of the pottery thus comprehended would involve setting up quite a number of named types or subtypes, mostly artificial and uncertain categories, as the variations in style of design do not correlate with the variations in finish and texture, and successive development or time significance is uncertain (see Martin 1936, 80-94; Morris 1939, 274).

The material from Mancos Canyon sites assigned to this category seems to fit the rather broad published definition; and, despite considerable variation and transitional gradations, constitutes one group, stage, or complex--one type in a broad sense. Undoubtedly it could, with further study, be subdivided into three or four more unitary types (much of my better finished so-called Mancos is McElmo Black-on-white as defined by Gila Pueblo; see below). See Figs. 37 and 38.

Technically, Mancos Black-on-white is characterized by tapered direct rims, unpainted or painted (sometimes smoothly rounded or nearly squared, sometimes ticked); moderately thin vessel walls; smooth, generally well polished, largely unslipped surfaces; occasional fireclouds; hard, rather fine-textured core, typically

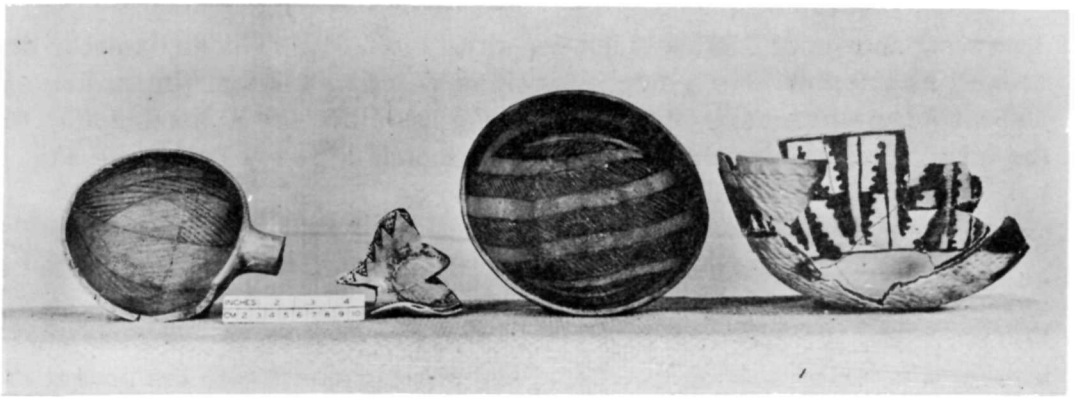


Fig. 37. Pottery from Site 1. Left, Tusayan Black-on-red; others Mancos Black-on-white. Vessel on right has corrugated exterior. Left to right, Specimens 7/18. 1/26, 1/3, 1/25.

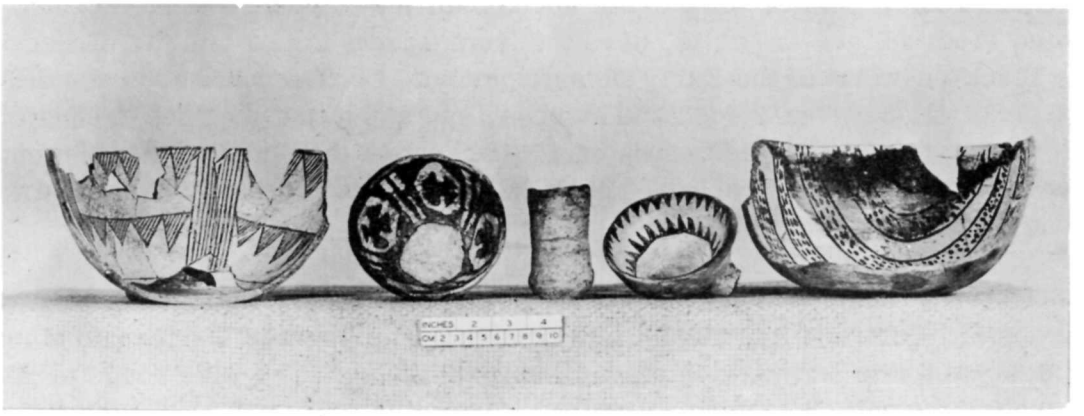


Fig. 38. Mancos Black-on-white from Site 7, with small Plain Gray jar in center. Left to right, Specimens 7/6, 7/10, 7/9, 7/1, 7/12.

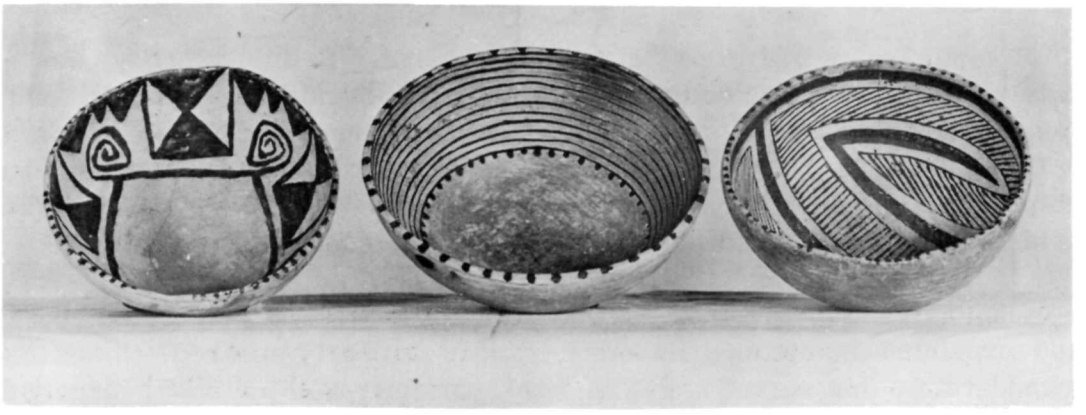


Fig. 39. Black-on-white bowls in the collection of the Laboratory of Anthropology, Santa Fe, illustrating the gradation between Mancos and Mesa Verde. Photo courtesy Laboratory of Anthropology.

dark bluish gray, frequently nearly black, but also very often light gray; iron paint; sherd temper.

The material falls into four main groups on the basis of design: (1) heavy solid elements, especially arrangements of triangles; (2) hachure-filled elements, mainly bands, in so-called Dogoszhi style, mostly coarse and careless compared to Chaco 2; (3) rectilinear allover patterns of lines of stripes; (4) arrangements, generally crude, of simple lines and/or dots. There are also miscellaneous combinations of elements, curvilinear designs, etc.

The first style, that of heavy solid elements, is perhaps the most typical and best known, or at least the most distinctive. The pottery corresponds very well to the definition of Mancos Black-on-white by objective characteristics, is well polished, and includes very few squared and ticked rims. Part of the material in rectilinear and lines-and/or-dots styles is also well done, part is poorly finished and crude; squared and ticked rims do not seem to occur.

The hachure-filled style and the miscellaneous combinations range from quite poorly finished, with tapered rims, to quite well made, with squared and ticked rims, but not with thick walls and high finish like Mesa Verde Black-on-white. The use of hachure evidently (from stratigraphic as well as typological indications) runs late, and it persists as a part of one classic Mesa Verde decorative style. But squiggled hachure goes back to Pueblo I, and the straight hachure includes both crudely done work in rather broad lines on typical and well finished Mancos pottery and fairly neat hachure on rather inferior pottery (see Fig. 37, c).

Evidently the potters of the Mancos period were in touch with and influenced by both the eastern and western San Juan. Generally Mancos Black-on-white has been called "Chaco" pottery or thought of as closely related to Chaco pottery; but the solid-elements style may be thought of as coming from northeastern Arizona, and most of the hachure is actually more like Dogoszhi than like Chaco.

Martin (1936, 84) states that he believes Mancos Black-on-white is generally slipped. Miss Shepard finds 20% to 50% slipped in the La Plata district (in Morris 1939). The material from Mancos Canyon seems to be even less frequently slipped. Most is well polished, so-called compacted, not observably slipped. Out of over 200 sherds of Mancos Black-on-white retained from Site 11, most of which were examined under the binocular microscope, only 8 seem positively slipped. A similar low proportion appears in the far larger collection of Mancos sherds from Site 1. To the west in southern Utah, a bluish creamy slip, rather uneven and streaky, occurs on some of the sherds of Mancos type.

The proportions of various rim styles is indicated by the following data from a sample of bowl rim sherds from Site 1: hachure-filled decoration--43 tapered and

unpainted, 7 tapered or rounded and painted, 8 rounded and dotted, 1 square and dotted; checkered designs--8 tapered and unpainted, 1 square dotted; solid triangles--no squared or dotted.

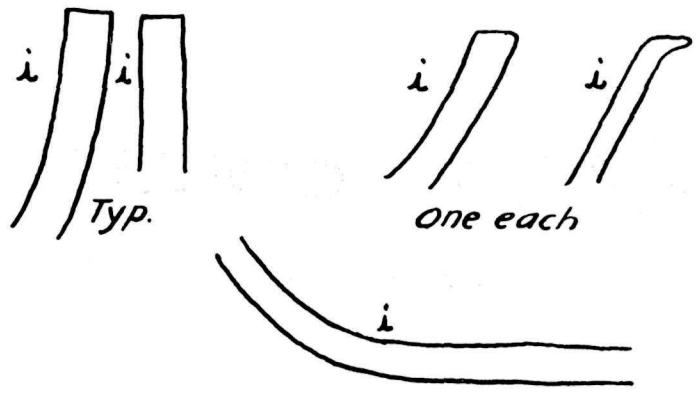
Exterior designs on Mancos Black-on-white bowls occur, though infrequently (see Martin 1936, 85), aside from accidental streaks from the rim and accidental dots. In one case the dots of a ticked rim are regularly (that is intentionally) carried over for 1/4 inch down the exterior. Two other bowl sherds from Site 1 have crude, rectilinear arrangements of lines below the rim similar to the simplest Mesa Verde exterior designs. One of these has a square, dotted rim, another Mesa Verde diagnostic, but seems nevertheless to be iron paint Mancos pottery. Specimen 7/12 bears a cog-wheel design on the exterior. See Fig. 44.

Zoömorphic designs on Mancos Black-on-white include two examples of Site 1 sherds. One is a stylized parrot on the corner of a hollow square, such as occur on squares or triangles in St. Johns Polychrome and Four-Mile Polychrome, Jeddito Black-on-yellow, and Zuni and Rio Grande glazes. The other is a portion of a cross-hatched quadruped with solid line bent legs. A sherd from Site 4 is decorated with part of what seems to have been a turkey. See Fig. 45, top.

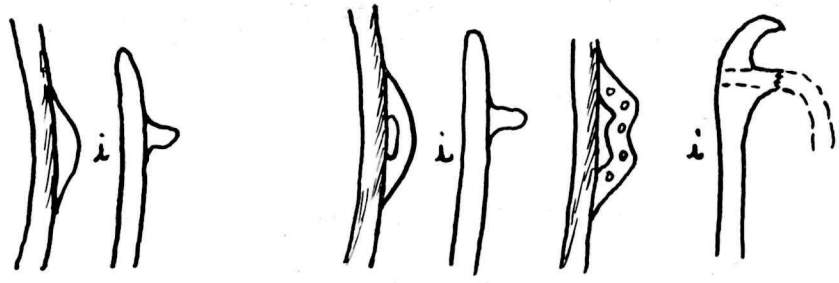
Jar necks are frequently decorated. Painted rims, including lip interiors, and horizontal lines encircling the neck are most common. From Site 11 there are 11 undecorated, 7 decorated; from Site 1 there are 18 undecorated, 26 decorated (including decoration of rim only). Solid triangles from the rim, or solid or hachure-filled designs evidently carrying up from the body of the vessel, seem to occur only on necks which rise smoothly from the body, without a break or carina or a sharp curve. On these the rim is not painted or dotted, and there is no everted lip. Most jar necks curve rapidly, or break abruptly to the vertical. The height of the vertical stretch from carina to lip on the inside is generally 40 to 45 mm. (1 1/2 to 1 3/4 in.).

Large jars evidently are of the olla shape familiar in the general area and characteristic of Mancos Black-on-white (see Martin 1936, Fig. 29; Morris, 1939, Pl. 296-298; Fewkes 1916, Pl. VIII: a; Nordenskiold, Pl. XXXI). There are sherds from Site 1 of three or more pitchers of a shape common in Chaco Canyon and known from the La Plata (Morris 1939, Pl. 293; f-i). The intrusive vessel of Chaco 3 is of this shape. Vertical walls, direct rim, and vertical handle are attested by sherds, decorated with vertical and zigzag vertical hatched bands and with dots arranged in diamonds on a flaky white slip. Other sherds of squat and shouldered lower bodies are of similar vessels, possibly the same ones.

Jar bottoms are almost all concave. On some the circumference is flat around the inward bulge and breaks sharply into the curving sides. Flat jar bottoms seem to be of pitchers rather than ollas. At least two round-bottomed pitchers also occur at Site 1; and pitchers also include indented bottoms. Bowls with concave bottoms occur,

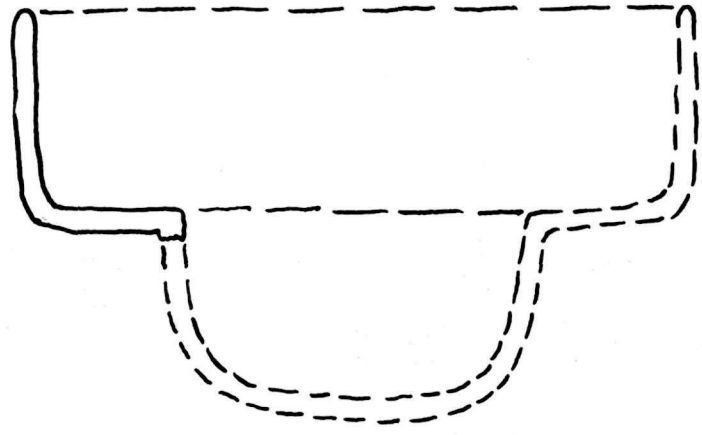


Mesa Verde Black-on-white bowls



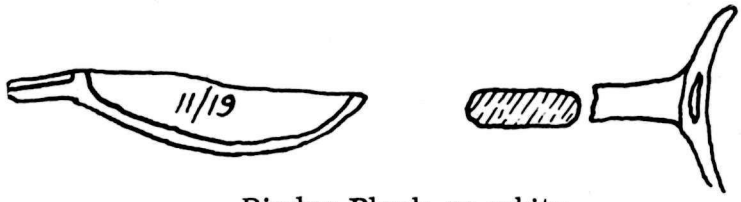
lug - from above and section

handles - from above and section

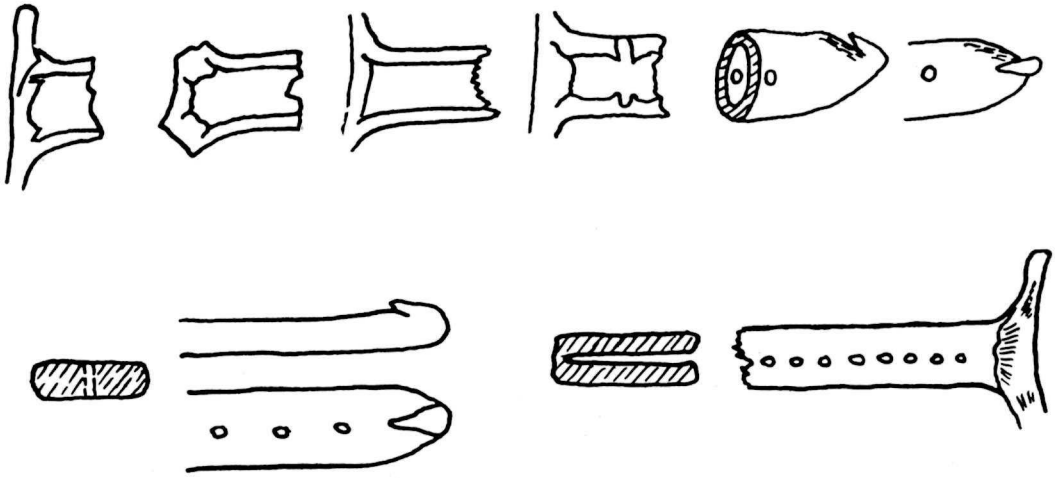


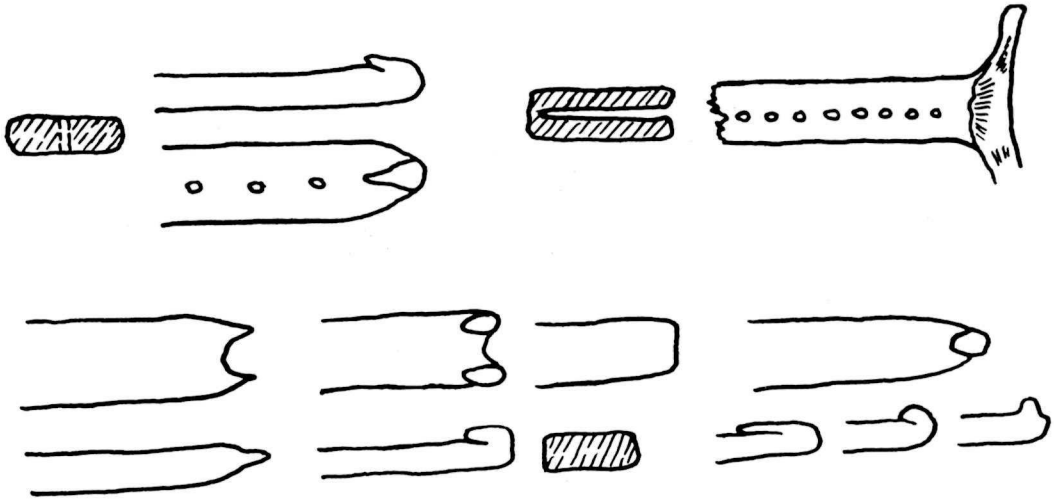
Mancos Black-on-white bowls, Site 1

Fig. 40. Details of black-on-white bowls.

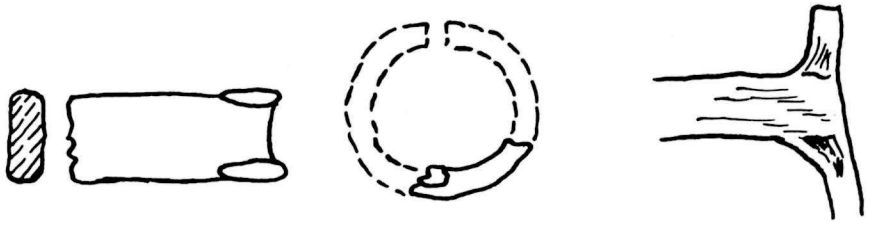


Piedra Black-on-white



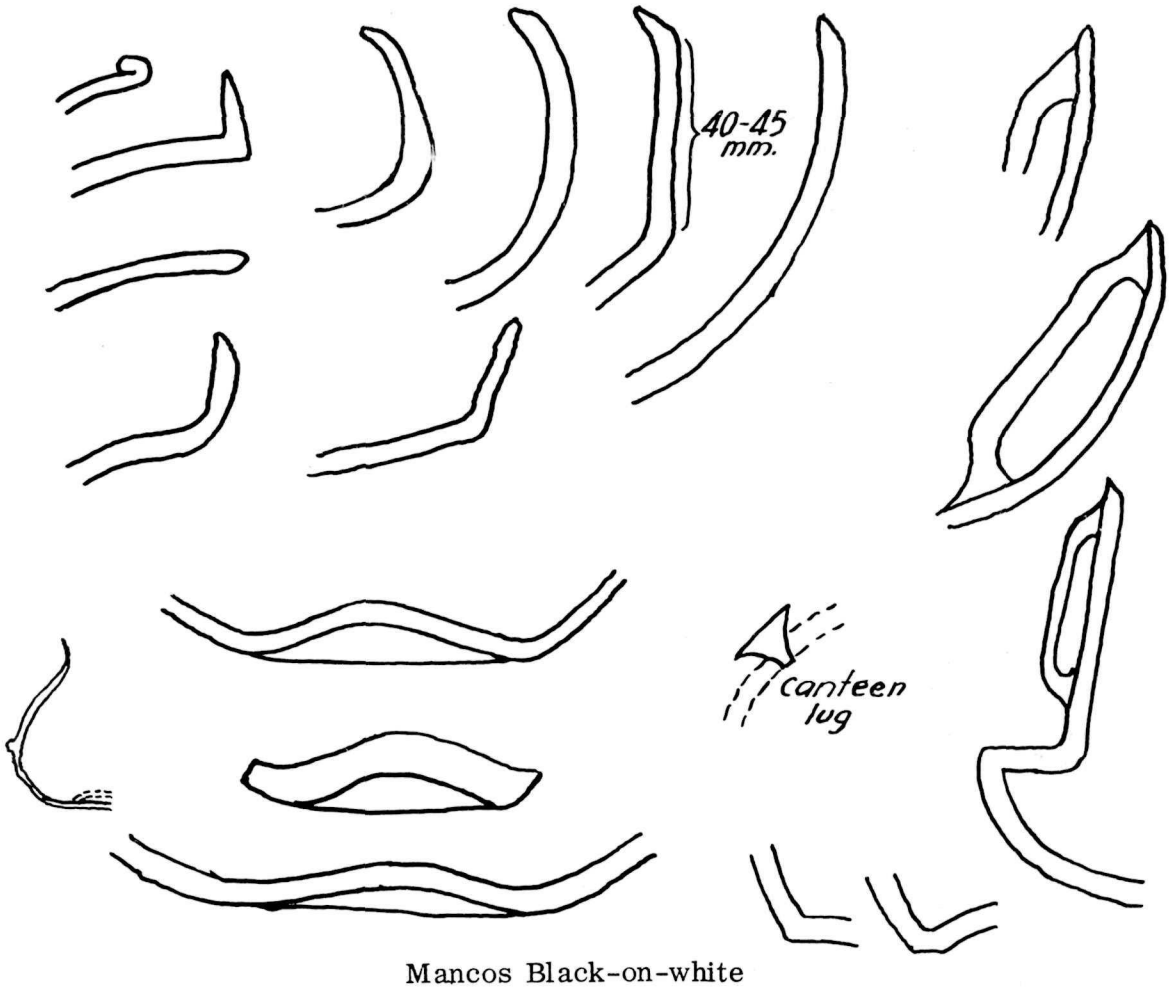


Mancos Black-on-white

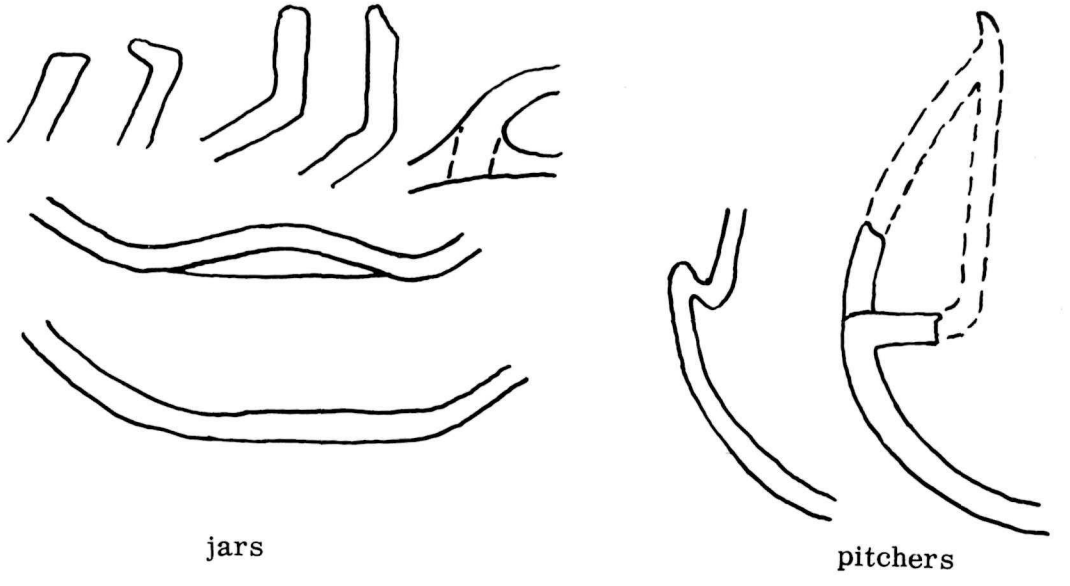


Mesa Verde Black-on-white

Fig. 41. Details of black-on-white ladle handles.



Mancos Black-on-white

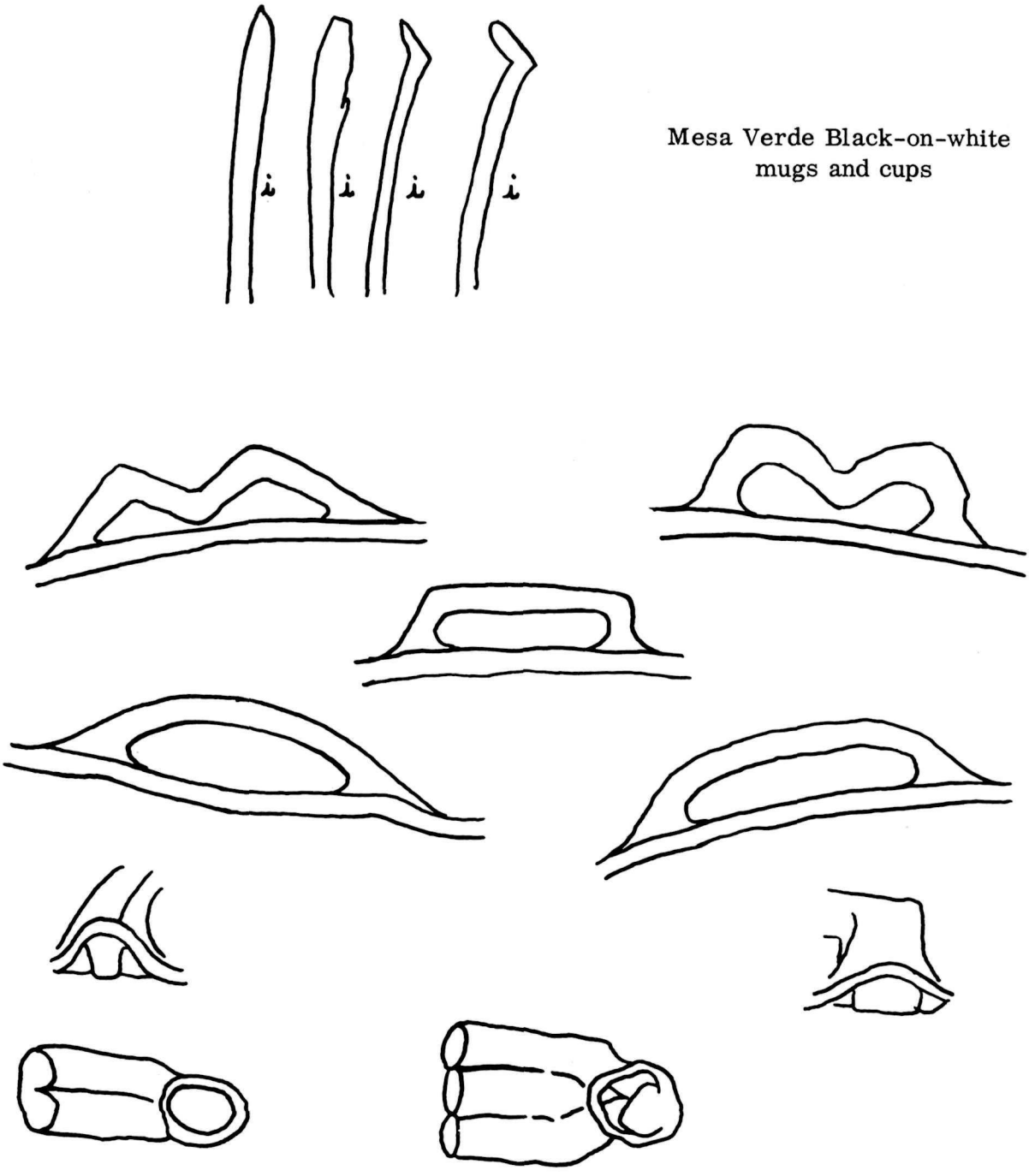


jars

pitchers

Mesa Verde Black-on-white

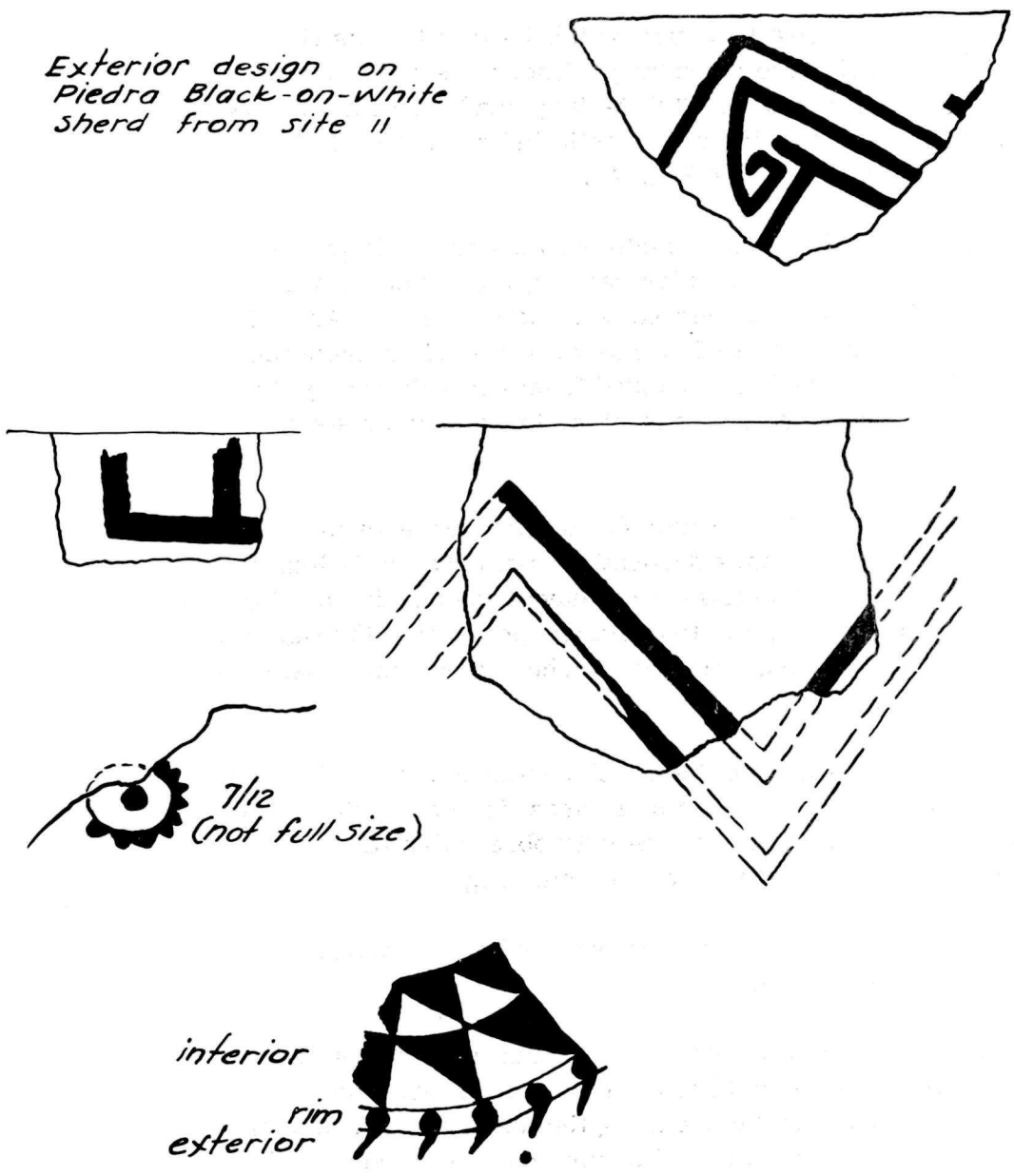
Fig. 42. Details of black-on-white jars and pitchers. Interior of profiles to the right.



Mesa Verde Black-on-white
mugs and cups

Mancos Black-on-white jar handles

Fig. 43. Details of black-on-white mug and cup rims and jar handles.



Exterior decoration of Mancos Black-on-white bowls

Fig. 44. Exterior decoration of black-on-white pottery.

for example, Specimen 1/3, although most are rounded and flattened. See Figs. 40, 42.

Ladles from Site 1 include both half-gourd shape (1/26 and sherds of four others) and bowl-and-handle type (abundant). There are two ladles of the intermediate trough handle variety. There were 20 flat-strap handle fragments from Site 1, small to quite large, presumably from ladles; 35 solid ladle handles of circular or flat oval section; 21 hollow ladle handles. See Fig. 41.

The solid ladle handles include 10 unpainted fragments lacking both ends; an undecorated small one of circular section; 8 of circular section with very simple decoration; 17 of flat-oval section, variously painted. Almost all ends are twisted up and back. One has a longitudinal row of perforations from top to bottom; one has a longitudinal row of tiny holes pricked from one side nearly through to the other. In cases where the juncture is observable, these handles seem to be applied (welded) rather than inserted (riveted).

Eight of the hollow-handle sherds were undecorated small fragments. Four of the other larger ones lack decoration, but only one is long enough to permit the statement that the entire handle must have been unpainted. Four are perforated three or four times along the top, six are perforated through both sides. Four possibly lack perforation. All are attached by welding. All ends found are turned up and twisted over.

Specimen 3/13, from the south recess of a Mesa Verde kiva, seems to be Mancos Black-on-white. It contains three tiny concretions and a little pellet of clay. It is unperforated, but provides the only observable instance of an open space under and divided by the overturned twisted end. Fig. 57.

Mancos Black-on-white hollow ladle handle attachments from Site 11 are inserted rather than welded.

Small horizontal handles near the rim sometimes occur on bowls. From Site 1 there are four applied small loops: two similar but unperforated small flat lugs, two larger flat-loop bowl handles, one applied undecorated, and one riveted and dotted. There is also a bowl sherd with the riveted end of a vertical handle just below an outcurved rim. Specimen 7/10, a very small bowl, has a pair of lugs 1/4 in. in diameter 1/2 in. apart.

Jar handles evidently were placed horizontally near the maximum diameter (see Martin 1936, Fig. 29; Morris 1939, Pl. 296-298; Fewkes 1916, Pl. VIII: a; Nordenskiold, Pl. XXXI). Most are flat straps, often bent inward, rarely curving outward between the angles of the leg portions. One-rope (circular section), two-rope, and three-rope jar handles also occur. Most seem to be welded on; a few of each shape or variety are completely riveted in. See Fig. 43.

In addition to the overwhelmingly predominant food bowls, the abundant bowl-and-handle ladles, and the less common large jars, pitchers, and half-gourd ladles, there are two rims from Site 1 of so-called seed-jars or squash-pots of an earlyish style of decoration (see Morris 1939, 206), and three sherds of vessels of unusual shape. One was clearly a twice curved bowl with an inside shelf. One must have been a vessel with a T-shaped opening (see Morris 1939, Pl. 294: e, 302: 1). The third was probably an effigy of some kind, or possibly a submarine-shaped vessel. There are also two large lugs, a fragment which suggests the ears of an effigy, a tiny handle (or, rather, perforated lug) from a very small jar, and an unpainted mushroom-shaped object which is probably a lug from the shoulder of a canteen or small jar (see Morris 1939, Pl. 297: f).

Still other forms are reported from the La Plata, such as bird effigies and a submarine-shaped vessel (see Morris 1939, 207); mugs are not known (contrast Colton and Hargrave 1937, 231, with Martin 1936, 83, on which the former is based).

Under Piedra Black-on-white the occurrence of two sherds with tooled-coil exteriors was mentioned. Variants of Mancos Black-on-white with structural or textural embellishment include not only bowls with corrugated or basket-marked exterior but also two jar sherds combining black-on-white slip and corrugation. These minor but interesting variants can be classified in five groups:

1. Mancos Black-on-white bowls with unindented polished coil exterior-- one sherd from Site 11, hatch-filled band interior decoration.

2. Steep-walled bowl with white-slipped interior, probably Mancos (interior decoration lacking); exterior tool-emphasized narrow coils, slipped, polished and painted-- a sherd from Site 7, paint on exterior apparently restricted to large dots.

3. Mancos Black-on-white bowls with indented corrugated exteriors--Site 1, Specimen 1/25 and 26 sherds (one surface, one from 15 in. to 18 in. below surface, others general); decoration of interior including squiggled hachure, coarse straight hachure, lines and dots, heavy solids, a few approaching Mesa Verde in style; Site 4, one sherd; Site 7, three sherds (solid designs); Site 11, five sherds (solid designs); Site 21, two sherds (hatched designs). Exteriors unslipped and unpolished except for several sherds from Site 1 with broad, flattish, smeared coils only slightly indented, which seem to be slipped and slightly polished; these are mostly solid designs, one is hachure and one is lines and dots.

4. Black-on-white corrugated jars. Two rim sherds. One from Site 7 with solid exterior designs, so far as can be seen; flat slightly indented corrugations, slipped and polished; interior unslipped. One from Site 1 with no exterior decoration showing; typical flat-wavy corrugation; white slipped inside and out; inside of lip ticked with large dots.

5. Mancos Black-on-white bowls, basket-marked exterior. Unslipped exterior: two from Site 1 (one smeared, basket imprint partially obliterated), one from Site 7 (simple line designs). Slipped exterior, no painted exterior decoration: one from Site 1 (linear design), three from Site 3 (one with horizontal broad lines, one with Mesa Verde rim, an unpainted bottom). Slipped and painted exterior: two from Site 1; one small, design uncertain, one with large terraced designs on white slip inside and out.

No need is seen for designation of these variants by type names. They can be referred to more descriptively and not too inconveniently simply as: Piedra Black-on-white, tooled-coil exterior; variant 1. Mancos Black-on-white, unindented-coil exterior; 2. Mancos Black-on-white, painted-on-coil exterior; 3. Mancos Black-on-white, corrugated exterior (unslipped and slipped; possibly painted occurs); 4. Mancos Black-on-white corrugated jars; 5. Mancos Black-on-white, basket-marked exterior (unslipped, slipped, slipped and painted).

Separate names, such as "Flagstaff Corrugated" (McGregor 1937, 25) or "Shato Black-on-white" (Colton 1941, 49) for Black Mesa Black-on-white with corrugated exterior, or "Chevalon Black-on-white" for Holbrook Black-on-white with corrugated exterior (Colton 1941, 54), strike me as unnecessary and probably confusing additions. Corrugated exteriors of black-on-white bowls occur sporadically, rarely but widely, in Pueblo II as a variant treatment of most--possibly all-major types of the period (Colton 1943, 317; and for example Holmes 1886, Figs. 244 and 245).

The basket-marked bowl exteriors bearing white slips and painted designs and the black-on-white-on-corrugated jars are more unusual and interesting; the temptation to give names to these is stronger. However, I have only two sherds of each, and no special temporal or cultural significance is known.

The varieties of Mancos bowls with embellished exteriors, including painted-on-basket marked, are known elsewhere in the area (for example, Leh 1942, 289, Fig. 16; Fewkes 1920, 62; Brew 1946, 284, 288-289) and described thoroughly for the next drainage to the east (Morris 1939, 201), but the painted-on-corrugated jars are found very rarely. Three such sherds were found at Alkali Ridge (Brew 1946, 283). They also apparently occur in the Ackmen district, though are not illustrated or described (Martin 1938, 270, 272). Something similar may have been found at Cannonball; though the statement may refer simply to banded-neck gray (Morley 1908, 609).

A large sherd from the Holly Canyon group of ruins (Hovenweep National Monument, Colorado) is of an unslipped Mancos Black-on-white jar with the short vertical neck corrugated (five coils, lightly and irregularly indented; partly smeared). A combination which is unique so far as I know is illustrated from the Sevier drainage in west-central Utah, namely a jar which is black-on-gray to the shoulder, indented-corrugated below (Gillin 1941, Pl. VI-b: 20). By deciphering Gillin's cryptogram describing the type under which this is classified, it is possible to determine that this is not Mancos; probably it is of the local Sevier gray ware.

The following additions may be made to the formal description published in the Colton and Hargrave Handbook of 1937 (pp. 230-231):

Mancos Black-on-white.

Additional synonym: Early or Chaco Pueblo III Black-on-white (Morris 1939).

Additional description: Morris, 1939, 201, 206-212, 274.

Additional illustrations: Morris, Pl. 283-300; Fewkes, 1916, Pl. VII.

Stage: Pueblo II or III-A, Mancos focus.

Time: probably about A.D. 950 to around A.D. 1150.

Description:

Texture: variable, typically fine and hard.

Surface finish: quite variable, frequently unslipped.

Fire clouds: occasional.

Forms: bowls, large jars of olla shape with horizontal handles at maximum diameter, bowl-and-handle dippers; less often, pitchers, half-gourd ladles; rarely, canteens, seed-jars, effigies, submarine shaped vessels.

Decoration: four main styles--(1) solid elements, especially triangles, like Black Mesa but triangles seldom ticked; (2) hachure-filled elements, especially bands, like Dogoszhi and Chaco 2; (3) crude lines and dots; (4) angular allover arrangements of parallel lines or stripes. In addition, mixed and miscellaneous designs including curvilinear. Simple decoration of bowl exteriors occasional.

Range: southeastern Utah and southwestern Colorado, northwesternmost New Mexico, part of northeasternmost Arizona.

The following delimitation is based largely on sherd collections at the Laboratory of Anthropology in Santa Fe. The northernmost known occurrence is in Paradox Valley, Colorado (see Huscher and Huscher 1943, 38, for occurrence on the intervening Uncompahgre Plateau, in so-called hogan sites possibly representing early Apachean occupation). On the south the range extends nearly to the vicinity of Gallup. Mancos occurs with Chaco 2 and 3 in Chaco Canyon sites, for example Penasca Blanca (collection LA 225, the Mancos well developed and typologically late). At Star Lake some

30 miles further southeast, a very little Mancos occurs, with Chaco and Mesa Verde (LA 1061, 1062). One of several sites on the Mariano Lake road, only 8 miles northeast of Gallup, includes a few sherds of advanced Mancos Black-on-white like that at Penasca Blanca, associated with Chaco 1-2-3, Wingate Black-on-Red, Citadel Polychrome, and Reserve Smudged (LA 1482). One sherd of Mancos is known from the Manuelito district southwest of Gallup (Reed 1944a).

In the area of the Chuska Mountains, west of the Chaco, a little advanced Mancos occurs with Chaco 1-2-3, plus Wingate Black-on-red and Querino Polychrome, in a site near Toadlena (LA 2040). Further north, just above the Lukachukai Mountains, a site on Setka Wash at the Red Rock road, LA 692, yields abundant Mancos, plus a Pueblo I component (Chaco 1-Red Mesa Black-on-white and banded-neck gray, La Plata Black-on-orange and Bluff Black-on-red). At LA 682 near Sanostee, however, between the two sites just mentioned, typical Mancos is missing, though typical Mesa Verde is present. The pottery which is typologically of the Chaco-Mancos period at this site is rather distinctive, affinis Chaco 2 in a general way. Intrusives at this site close to the Lukachukai Mountains include La Plata and Bluff Black-on-red, Wingate Black-on-red and St. Johns Polychrome.

To the southwest, collection LA 685 from the east side of the San Juan 10 miles below Shiprock shows a Mancos-Mesa Verde site with a little Bluff Black-on-red, like sites in the Mancos and McElmo-Yellowjacket-Hovenweep drainages; and sites in the Tsegihochoin (Walker Creek drainage) on the northwest side of the Carrizo Mountains yield a little Mancos and a good deal of Mesa Verde, hardly any Tusayan White Ware (LA 699, 700, 701). Pure sites of the Chaco-Mancos period have not been collected in this area.

Within northeastern Arizona, on the west side of the mountain ranges which run north-south close to the state line, Mancos Black-on-white, as well as an abundance of classic Mesa Verde, occurs in the Canyon de Chelly district in the upper Chinle drainage. Mancos and Mesa Verde types do not, however, extend into the Tsegi or Kayenta district, the northwestern drainage of the Chinle. The westernmost site characterized by Mancos Black-on-white of which I am aware is a large pueblo ruin near Salinas Trading Post, about 20 miles southwest of Chinle and 20 miles northeast of Keams Canyon.

To the northwestward, the bulk of the black-on-white pottery at Lowry (Martin 1938) and on Alkali Ridge (Brew, 1946) falls into the rather broad Mancos category; and the same kind of pottery is found still further west, but not, so far as I know, beyond the Colorado River.

Evidently the boundary of the occurrence of Mancos Black-on-white sites is to be drawn from a point between Aztec and Chaco through a point between Setka Wash and Sanostee to an undetermined point on the San Juan near the Chinle, then north to

the west of Montezuma Creek. The limits of distribution of Mancos Black-on-white as minor constituent can be set approximately and tentatively at the Colorado River, Paradox Valley, the Piedra River, the Star Lake district, the vicinity of Gallup, and Toadlena.

Related contemporary types include Chaco 2, Chambers and Puerco Black-on-white in the vicinity of Gallup and Houck, Black Mesa and Dogoszhi in the western Anasazi area (from the Tsegi to Flagstaff, and related types in the Virgin River drainage). Absolute typological distinction between these types of Pueblo II Black-on-white decorated with hachure-filled or simple heavy solid elements is often hard to establish.

Relations between southwestern Colorado and Chaco Canyon pottery

The local La Plata Black-on-white is not distinguishable from that of the Chaco, so far as I can see. The local Pueblo I painted pottery is classified here as a separate type, Piedra Black-on-white, but ranges in the direction of typical or distinctive Chaco 1 and includes numerous sherds which could be so classified but which seem nevertheless essentially part of the local complex. In the same way, material from Pueblo Bonito of Pueblo I type which I have inspected includes much which resembles Piedra Black-on-white closely, although the lot of type sherds of Chaco I deposited at the Laboratory by Roberts does not.

In the Pueblo II or III-A material the intergradation between Mancos and Chaco 2 is even more troublesome (see Martin 1936, 112). So-called typical Mancos, of all styles of decoration, and so-called typical Chaco 2 are quite separate if "typical" is used to mean distinctive or extreme. The averages, however, are much less far apart, and many sherds of hachured or miscellaneous-design Mancos would be quite at home in the Chaco. The problem is complicated by the occurrence of a great deal of undoubted Mancos Black-on-white in Chaco Canyon sites (see further remarks below on the relationship between the Chaco and Mesa Verde branches).

A few sherds that seem to be typical (distinctive) Chaco 2 found in Mancos sites may be genuine intrusives; I believe, however, that in general the material resembling Chaco 2 is locally made and may be called Mancos.

Classical Chaco 3 presents no such difficulty; and sherds of a typical Chaco 3 pitcher at Site 1 are undoubtedly intrusive. In this connection it is of interest to note the abundance of Mancos Black-on-white of solid-elements style at Chaco Canyon, particularly in association with Chaco 3 ("McElmo Black-on-white" in Brand et al. 1937; Kluckhohn and Reiter 1939, and Dutton 1938). Fully half the sample lot of Pueblo III sherds from stratigraphic work in Chaco Canyon deposited at the Laboratory of Anthropology by Roberts is solid-style Mancos. In addition, Mesa Verde Black-on-white occurs in some quantity at sites in Chaco Canyon (sherds collected by the writer at Pueblo Pintado; sherds from the bench of Kiva 161, Pueblo Bonito, found by R. G. Vivian in 1941; Dutton 1938, 86).

The taxonomically improper designations Chaco 1, 2, 3 are used here because the published descriptions of named types for Chaco Canyon (Hawley 1936, 32-33, 42-44) seem to be virtually meaningless, not corresponding to actualities. An exception is Red Mesa Black-on-white (Gladwin 1934, 20; Kluckhohn and Reiter 1939, 52) which corresponds to Roberts' "Chaco Transitional 1-2" and is a specific and distinctive type.

The material from Mancos Canyon does not seem to include any true Red Mesa; the fairly numerous sherds which I so listed in original sherd analyses resemble Red Mesa only broadly and seem to represent a corresponding stage of the local development of Mancos Black-on-white. Material illustrated from the La Plata seems to be closer to true Red Mesa (Morris 1939, 202; Pl. 287: a-m and possibly p-s, 299: a and possibly e).

The eastern Anasazi black-on-white sequence is a particularly good example of the need for combination of approach between splitters and lumpers. A few varieties have been separated and named at the eastern (Mera 1935, 2, 3, 5) and western (Colton 1941, 56-59) edges of the general Chacoan or eastern Anasazi range; but the lack of similar specific differentiation in much of the upper San Juan has led to use of some of these names for the broad stages. For example, Kiatuthlanna is used for Chaco 1 in general (Hawley 1936, 27; Martin and Willis 1940), whereas Kiatuthlanna is actually a specific localized type with important differentiae: clear white surface, a Mogollon-like style of design (Roberts 1932; Gladwin 1935, 274; Haury 1936, 16-17 and Fig. 6).

General stage or group designations like "eastern Pueblo 1" but more concise and specific, are needed, as well as subdivision into local varieties like Piedra and Kiatuthlanna. The convenient Chaco 1, 2, 3 should not continue to be so broadly used, as the actual Chaco Canyon material (especially, of course, Chaco 3) has also its own local characteristics (see Kidder and Shepard 1936, 597).

Serious misunderstandings have been brought about by such usage; for instance, the so-called Chaco pottery of the Animas and La Plata valleys is Mancos Black-on-white (examination of material at the Laboratory of Anthropology, Santa Fe), presumably developed locally from the local La Plata Black-on-white of Basket Maker III and Piedra Black-on-white of Pueblo I. But calling it Chacoan has given rise to the notion that Aztec Ruin and other pueblos of this area were colonies built by migrants from Chaco Canyon. (As a matter of act, incidentally, Anna Shepard has hinted that instead, perhaps the earliest decorated pottery at Chaco Canyon was imported from this general northern area--Morris 1939, 277.)

Martin speaks of finding Red Mesa Black-on-white and an abundance of so-called Wingate Black-on-white at Lowry Pueblo, 40 miles farther north (Martin 1936, 79-80, 102-114, see Pl. XCVII: 2, XCVIII:1, XCIX: 2). The vessels illustrated as Red Mesa, however, obviously are not; they may be Chacoan (the two bowls would be Chaco 2, the seed jar Chaco 1), but they look more like Mancos. No Wingate Black-on-white is

illustrated, unfortunately; however, this otherwise unpublished name was used by H. S. Gladwin for Chaco 2. The material listed as Wingate at Lowry is probably largely Mancos Black-on-white decorated with hachure-filled bands, as this style of Mancos is not illustrated or discussed. The hachure-decorated bowl, Pl. XCVII: 1, is undoubtedly Chaco as captioned.

Morris (1939, 202-205, Pl. 283-292) divides the black-on-white of the La Plata district of Early Pueblo III, the Chaco period, about A.D. 975-1150 also referred to as Pueblo II, into Chaco, Chaco-like, and non-Chaco, and also recognizes a "forerunner of full Chaco." The last seems to be Red Mesa Black-on-white or its local equivalent, from the description and illustrations (see above). The so-called non-Chaco pottery of the Chaco period on the La Plata is clearly Mancos Black-on-white decorated with solid elements, lines and dots, and parallel stripes; the so-called Chaco-like is hachure-style Mancos. The so-called pure Chaco seems to include probably genuine Chaco 2 (Pl. 1) and Chaco 3 (Pl. 288, 2), and possibly some hachure-style Mancos (see Pl. 290; a, b).

The situation has been well summarized by Morris:

> ". . . pottery . . . of the Aztec Ruin. . . more Chacoesque than Chaco. . . is representative of the black-on-white ensemble that was in general use north of the river at the time when the best wares of the Chaco center were being made, and I believe is the result of local expression of the Chaco urge far more than of direct influence from the Chaco itself. . . .The occasional true Chaco specimens I regard as trade pieces, and the rare pure-Chaco sites as representative of actual colonization by small groups which come in from the south" (Morris 1939, 205).

There seem to be no sites of pure Chaco in Mancos Canyon, or among survey sherd collections in the Laboratory of Anthropology from the lower La Plata Valley, which I helped Deric Nusbaum collect in 1935.

The essential fact is, perhaps, that the term "Chaco" or "Chacoan" has been used as the equivalent of "eastern Anasazi." The impressive buildings, complex culture, and early florescence of Chaco Canyon have led many workers to regard it as the main center of Anasazi culture and all else as peripheral. Aside from any question as to the validity of this view, overemphasis of it and extended use of the term "Chacoan" have tended to obscure the essential local con-

tinuities in other portions of the eastern San Juan region. *

Mesa Verde Black-on-white

Mesa Verde Black-on-white is a familiar and important type, widely distributed and relatively well known. It has been described both concisely (Kidder 1924, 61; Colton and Hargrave 1937, 231-232) and fully (Morris 1939, 212-244, 276-277). It is distinguished by very thick walls, extremely smooth finish, carbon paint, squared rims, complex decoration. Bowl rims are generally dotted or otherwise painted. Decoration of bowl exteriors is frequent. Mugs constitute a highly distinctive shape. Two decorative styles are characteristic: horizontal, or encircling band, utilizing mostly solid elements between horizontal framing lines, and interlocking or allover style. The allover style, with interlocking hatched and solid elements, is essentially Tularosa style, and very possibly could be derived from Wingate Black-on-red imports.

That Mesa Verde Black-on-white is not always slipped has been recognized (Nordenskiold 1893, 84; Morris 1939, 213). Miss Shepard finds the majority to be slipped in the Johnson-La Plata district, the percentage ranging from 53 to 81 at different sites (Morris 1939, 277). The site with 47% unslipped is on the west, toward the Mancos; the site with only 18.7% unslipped is in the lower (southern) La Plata Valley. A sample of 50 Mesa Verde bowl sherds, from Mancos Canyon Site 11, examined under the binocular microscope, shows 17 slipped and 33 apparently unslipped. To

*After a discussion with R. Gordon Vivian on February 17, 1949, my views on the general relationship between the Chaco and Mesa Verde Branches are abruptly modified, although not so radically as to require rewriting to the text of this report, which I want now to leave as of 1947 without further major additions or revisions. Mr. Vivian's reasons for the view that the "main Aztec ruin," and that alone among known pueblos north of the San Juan, may have been built by actual Chaco Canyon colonists, and for the view that certain of the small pueblos in Chaco Canyon were probably built by parties of Mancos people coming in from the north, convert me to the established view that the Chaco and Mesa Verde developments are separate branches, not merely--as I have been tending to argue--successive periods with shift of emphasis.

The interpretation I would now accept, after discussions with Mr. Vivian and Dr. Bertha Dutton, both Chaco students of long standing, would run something like this: A general "eastern Basket Maker III" basic horizon, with "La Plata Black-on-white" the painted pottery-type all the way from the Puerco River north, began to differentiate in Pueblo I into local subdivisions (Kiathuthlanna, Chaco 1, Piedra; with the Alkali Ridge phenomenon a distinct outfit ceramically, though similar in most other categories); then between 900 or 950 (the Red Mesa time-level) and about 1150, Chaco and Mancos are definitely separate, although broadly similar with mutual inter-penetration--considerable actual colonization between the Chaco and the San Juan Valleys--and interchange of ideas; after 1150 or 1200, the general Chaco group disappears as such (west of the Jemez Mountains; immigration of Chacoans to the Upper Rio Grande occured about this time)

the west in southern Utah, the streaky and faintly bluish slip mentioned under Mancos Black-on-white occurs on some Mesa Verde sherds (present among sherds from the site on Montezuma Creek at Coal Bed Canyon, and among sherds collected by C. R. Steen on June 23, 1943, close to the Utah-Colorado line on the Ackmen-Hovenweep road; rare or absent among Mesa Verde sherds from the various ruin-groups of Hovenweep National Monument).

Mesa Verde Black-on-white is generally considered to be sherd-tempered. Miss Shephard finds that sherds examined from the Mesa Verde are sherd-tempered, as stated by Nordenskiold (Nordenskiold 1893, 87; Hawley 1936, 37; Colton and Hargrave 1937, 231-232), but that Mesa Verde Black-on-white from the La Plata is tempered preponderantly with crushed igneous rock of the same sorts as in early types of painted pottery (Morris 1939, 276). Sherd temper occurs in about 27% of the La Plata material. Sand occurs with the crushed rock, but no actual sand tempered, only 3 rock tempered. A similar percentage of the material from Sites 3 and 4 seems to be rock tempered.

Bowl sherds of Mesa Verde Black-on-white from Mancos Canyon include two slightly aberrant rims. One has the flat surface at an angle of about 30°, presumably on a slanting rim, instead of the typical IA4 rim (rim classification given by Colton and Hargrave 1937). The other has an everted lip with a flat upper surface which is similarly at an angle to the vessel wall. The square rims are generally dotted. Bowl bottoms are flattened. See Fig. 40.

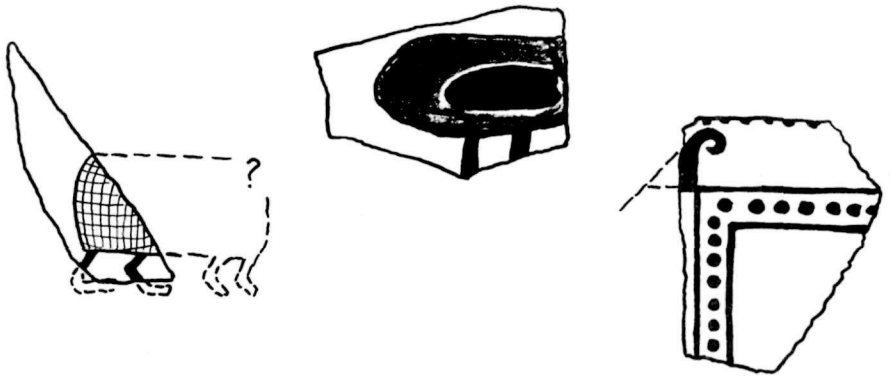
Exterior decoration is not very common, occurring in only 7 examples out of 76 sherds retained from Site 3 and 11 out of 54 from Site 4. Crude stripes and simple designs of lines are commonest as exterior decorations (see Morris 1939, Fig. 59: 22-26, Fig 60: 41-43). From Site 4 there are two examples of narrow horizontal bands, one hatch-filled and the other comprehending carelessly-drawn solid triangles, and one of isolated outlined squares containing each an inverted stylized animal. See Fig. 45.

Zoömorphic designs include the creature on a bowl exterior just mentioned and an hourglass-shaped figure from a bowl bottom which might easily be thought to represent a butterfly. Stylized parrots on the corners of a square are lacking. The frequent so-called Maltese cross, which also occurs in both Wingate-St. Johns and

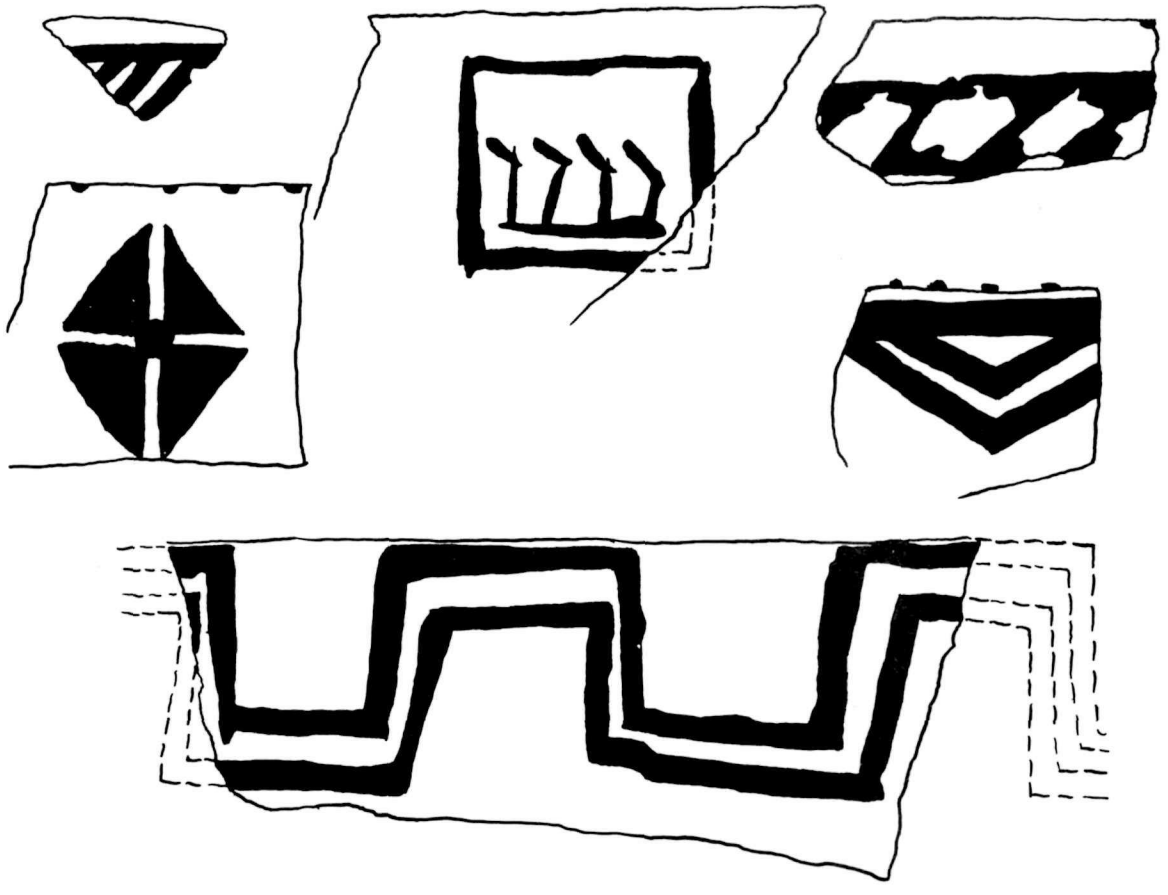
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and the final phase ("Montezuma focus") of the Mesa Verde branch is ubiquitous from the Chaco region to the Colorado River.

This conception resolves a number of difficulties which had bothered me and which I have heretofore glossed over or failed to explain away satisfactorily; it also fits better the idea of possible correlation of Tewa language broadly with Mesa Verde, Jemez speech with Chaco in a general way, and the Tiwa dialects with the original inhabitants of the Upper Rio Grande.



Zoomorphic designs on Mancos Black-on-white bowl interiors



Exterior decorations on Mesa Verde Black-on-white bowls from Site 4

Fig. 45. Designs on black-on-white bowls.

Mesa Verde, is possibly either a further conventionalization or the basis from which the parrot design was developed. This is not really a Maltese cross, but four triangles pendent to a small square. See Fig. 45.

At Site 4 the allover or interlocking style is rare in comparison to encircling band designs and miscellaneous designs of Mancos and so-called McElmo styles. At Site 3, which lacks a Mancos component and may be somewhat later, the ratio rises: 1 Mancos-McElmo to 3 horizontal-encircling to 2 allover-interlocking.

Jar bottoms are generally concave, occasionally flat and thickened. Jar necks are generally decorated, variable in lip formation. There are sherds also of pitchers of a type clearly related to the so-called Chacoan pitchers of the preceding period; a few with a wide vertical handle rising directly from the shoulder of a flattened-spherical body (see Morris 1939, Pl. 303: p-s); and one with a compressed, vertically-protruding shoulder on a hemispherical body. See Fig. 42. I have only a few sherds of mugs and a few of bulging mugs or cups, related to pitchers, one with a flared rim (see Morris 1939, Pl. 303: m-v). See Fig. 43, top.

There are twelve incomplete handles of bowl-and-handle ladles (see Morris 1939, 215) from Sites 3 and 4; one solid, circular in section, undecorated, riveted; five flat strap, or flattened oval section; six hollow, large, four of them apparently unperforated (open at the end?), one with tiny perforations in pairs. See Fig. 41. Jar handles are riveted, oval in section, horizontal. Bowl handles are lacking. No examples were found of the perforated jar handles (horizontal strap) which occur in the Hovenweep area.

Mesa Verde Black-on-white is one of the most widely distributed types of Southwestern pottery. It is at home in the entire San Juan drainage except the Tsegi; not only in southeastern Utah and southwestern Colorado but also northwestern New Mexico and the Chinle area of northeastern Arizona.

Three Turkey House and thirteenth century ruins in Canyon de Chelly are Mesa Verde sites; so is Poncho House--"Based upon pottery-types, Pueblo III in the lower Chinle is essentially Mesa Verde in character" (Hargrave 1935, 47). The late occupation of northwestern New Mexico is Mesa Verde, not only at Aztec but also in Chaco Canyon and in the drainage of the Rio Puerco to the south and east of the Chaco, including the vicinity of Mt. Taylor and Acoma.

Mesa Verde Black-on-white is the late Pueblo III decorated type for the entire eastern Anasazi area, reaching as far west as the Colorado River below the confluence with Green River (sherd collections at Laboratory of Anthropology deposited by G. W. Olcott of the National Park Service in 1943; survey by G. C. Baldwin of the Beef Basin-Dark Canyon area, October, 1945--a representative sample of sherds, from site No. Utah: W:1:14, examined with Baldwin in August 1946, about equally

divided between Mancos and Mesa Verde Black-on-white, with St. Johns Polychrome sherd of late decorative style, and variable gray corrugated; see typed report to the National Park Service by G. C. Baldwin, 1946). In the late thirteenth century it spread down the Rio Puerco to reach the Rio Grande and give rise to the fourteenth century type Galisteo Black-on-white and reach a southern limit--as colonies, not merely as trade--in the vicinity of Magdalena, New Mexico (Mera 1935). A little Mesa Verde Black-on-white reached Pecos, on the eastern edge of the Pueblo area (Kidder and Shepard 1936, 346).

The problem of McElmo Black-on-white

The term "McElmo" has been variously used for pottery of southwestern Colorado transitional between, or otherwise related to but somehow different from, the Mancos and Mesa Verde types. This is an extremely bothersome matter. After struggling with the literature, and confusing effect of which is indicated below, and after finding nothing in my material to constitute an unmistakably separate type, I decided to ignore the whole thing, calling it all Mancos it if was not Pueblo I or Mesa Verde, and calling all thick, smooth, square-rimmed, carbon paint pottery Mesa Verde, however sloppy the brushwork. This is much the easiest procedure. I find no correlation between style of design and quality of finish and/or dotted rims in Mancos Black-on-white; and Mesa Verde with early style and/or poorly drawn designs is often of the highest quality otherwise. A group nevertheless possibly distinct is treated below.

Transition between Mancos and Mesa Verde evidently was a rapid but irregular process. Possibly a McElmo stage could be separated off by sufficient study, probably including the material discussed below as "McElmo style." A succession of several stages could be set up typologically, though I am inclined to doubt that it could be confirmed stratigraphically.

The following quotation from Morris, based on many years' work with a great amount of Mesa Verde material, expresses the situation and the difficulty very well:

> "Kidder's definition (of Mesa Verde Black-on-White), previously quoted, refers to the ware of the classic stage, hence would be poorly exemplified by many specimens which I place among Mesa Verde ware, because they are early, some paralleling Kidder's proto-Mesa Verde and others going back, I believe, still farther. It may be objected that I should have separated the vessels. . . into classes such as, for example, early, middle, and classic. This I did not find it possible to do in a way with which I could be satisfied. The whole progression was too continuous to permit of definite time subdivision. Peculiarities of surface treatment and pattern held over, so that individual specimens,

which if found singly would be called early, are found in the same grave with classic. And always there were good and bad potters. The work of the latter, no matter how late, would be all too easy to class as early" (Morris 1939, 214).

There are many sherds which I tentatively listed as McElmo originally, but almost all of them are actually perfectly good Mesa Verde, perhaps lacking exterior decoration and dotted rims or else with poorly executed decoration. The various departures from Mesa Verde criteria do not seem to occur together. The sherds which I cannot conscientiously call either advanced Mancos or poorly done but classic Mesa Verde are for the most part not sufficiently coherent a group to designate as a type, and rather than "McElmo Black-on-white" can only be called intermediate, transitional, or off-brand Mancos or Mesa Verde (see Brew 1946, 285).

A possible exception to this is the group of fifty-odd so-called McElmo sherds from the pueblo rooms and upper refuse levels of Site 1. These include few if any that are wholly acceptable as good examples of classic Mesa Verde, but all are carbon paint and readily distinguishable from normal Mancos. A few are thick, with Mesa Verde designs; but most are less thick, though very smooth with a slick feel. Bowl rims are rounded rather than squared flat, but generally painted. There are no examples of exterior decoration of bowls. Designs are stripes (see Morris 1939, Pl. 316: a-n, 317: i-q; Martin 1936, Pl. CI, CIV:2, CV; Holmes 1886, Fig. 283), arrangements of large solid triangles alternating with line-filled triangular areas (see Morris 1939, Pl. 316:p, 320:e, h) and encircling band decoration consisting of horizontal lines only (see Martin 1936, Fig. 35a).

This group perhaps should be classified separately. This material is what I had in mind when I speak of "McElmo style." there are a few sherds of this sort from Sites 3, 4, and 11; the large sherd found on the bench of the kiva at Site 7 is of this style. Other than the indications at Site 1, I have no stratigraphic evidence for a McElmo type (the tree ring dates of about A.D. 1195 from Room H, Site 1 are presumably to be correlated with this final ceramic phase of occupation, and fit well Gladwin's and O'Bryan's dating of the so-called McElmo phase).

The material of so-called McElmo style from Site 1, and the few similar sherds from other sites, more or less correspond to certain of the stated or implied definitions of McElmo Black-on-white and in part to the published illustrations so captioned.

The possibility that McElmo is a local form of Mesa Verde in a portion of the Mesa Verde range (Kidder and Shepard 1936, 345) is vitiated by the occurrence of the style both in the Mancos drainage, including the Mesa Verde itself, and in the western drainages, Hovenweep and Montezuma Creek. Evidence from districts other than Mancos Canyon is unclear as to separate occurrence of McElmo.

The original illustration of so-called proto-Mesa Verde (Kidder 1924, Pl. 27a) includes specimens which look like Mancos, and specimens of McElmo style and other unspecialized Mesa Verde; and is from Cannonball Pueblo, which also yielded good classical Mesa Verde (photographs at the Museum of New Mexico, Santa Fe; Morley 1908, Pl. XXXIX).

A photograph taken years ago by the late Frank Pinkley, included here as Fig. 46, of pottery collected by a rancher between Hovenweep and Blanding, shows a similar assemblage--mostly McElmo style, a few pieces which could be classical Mesa Verde, a few which are probably Mancos.

A sherd collection from the large Mesa Verde ruin on Montezuma Creek at the mouth of Coal Bed Canyon, (an extremely interesting site visited by W. H. Jackson in 1875 /Jackson 1878, 427 and Pl. LIII/ and by T.M. Prudden 25 years later /Prudden 1903/), made by C.R. Steen and myself on May 12, 1943, includes no McElmo style, though there are a few Mancos sherds and a few Mesa Verde with sloppily done Mancos-style designs, as well as a Pueblo I component.

Pottery illustrated from Alkali Ridge, and perhaps other sites in the western Montezuma drainage (Cummings 1910) comprises developed Mesa Verde, typical McElmo style, and a little Mancos.

Pottery illustrated from unit-type pueblos in the Ackmen-Lowry district (Martin 1929) includes 12 good Mesa Verde bowls and mugs, 4 vessels of McElmo style, 4 bowls evidently Mancos (one with squiggled hachure), 2 Mancos pitchers, 8 typical mugs, possibly Mesa Verde with Mancos style decoration, and 6 ladles apparently Mancos.

Similarly, pottery illustrated from Spruce Tree House in the Mesa Verde (Fewkes 1909) includes a few McElmo style bowls, Mancos style Mesa Verde, and good classic ware.

An additional indication, however, of the possible occurrence of this style as a separate stage, is that two bowls unmistakably of McElmo style were found together in a separate grave in Pool Canyon, with a small ladle associated which is of uncertain type but surely not classical Mesa Verde (Nordenskiold 1893, 49). A large mended sherd of a similar vessel is from Painted Kiva House, which yielded also a large piece of a classical bowl (Nordenskiold 1893, Pl. XXX /caption page/ and XXVIII:5). Two bowls of another style possibly to be classified as McElmo were found together in grave "h" at Step House (Nordenskiold 1893, 41).

Painted Cave in the Chinle drainage contributes new data bearing on this problem. The black-on-white pottery of this site, datable to the second quarter of the thirteenth century, is Mesa Verde (except for intrusive Walnut Black-on-white from the Little Colorado), but not fully classical:

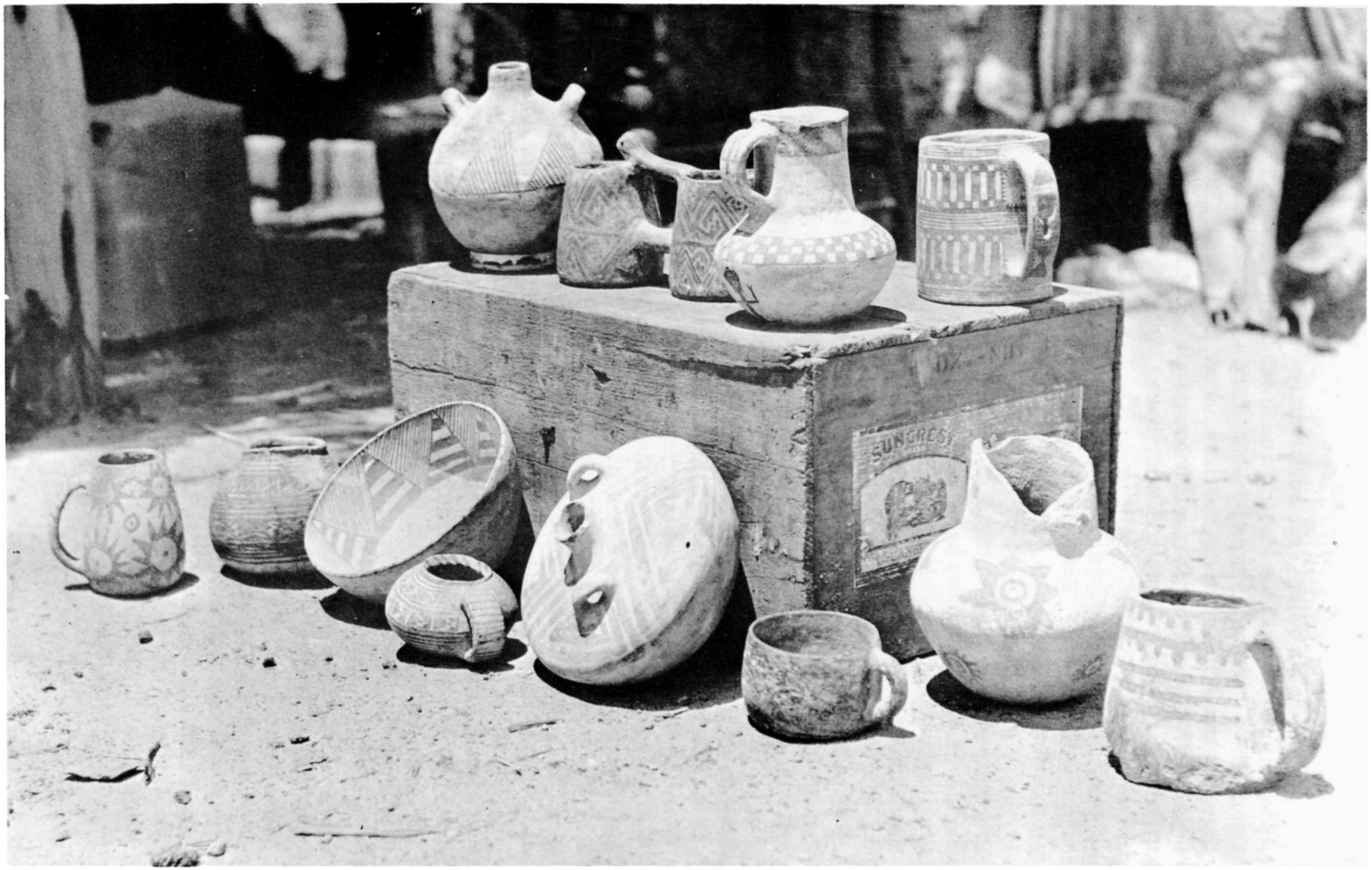


Fig. 46. Collection of so-called McElmo Black-on-white from between Hovenweep and Blanding.

> "The shape of the large horizontally-handled storage jar of Plate 28 is familiar in the Mesa Verde area, but the design. . . reminds one more of the broad-ribboned style of painting in the Kayenta area. Other pieces, too, are not as emphatically done in the Mesa Verde style as they might be, possibly due to the peripheral location of Painted Cave" (Haury 1945, 56).

Actually the jar is typical McElmo style; at least some of the Mesa Verde bowls could well be called McElmo style. Exterior decoration occurred on only one sherd. One large mug sherd was classified as "McElmo Black-on-white."

It is quite possible that a considerable part of what I have treated as Mancos Black-on-white is actually carbon paint instead of iron paint, and should, in that case, be classified separately. This also would correspond to some of the published statements regarding so-called McElmo. The simpler tests for paint type are apparently undependable; I cannot make the more complicated tests. By visual inspection, megascopic and microscopic, the paint seems to be iron on the La Plata, Piedra, and Mancos types, distinct from that of McElmo style and Mesa Verde. Much of the Mancos could, however, be organic paint so far as I can tell.

Miss Shepard finds organic paint (frequently, however, on rock tempered pottery) as well as mineral paint in Early Pueblo III Black-on-white of the La Plata district (Morris 1939, 275). It is definitely secondary in quantity, evidently (Morris 1939, 206). At least one sherd combines the two paints (Morris 1939, Pl. 291:a). The illustrated specimens captioned as having organic paint include Mancos style decoration (Morris 1939, Pl. 296: d, 297:a, c, f, 299; f-j), McElmo style (Morris Pl. 301: a-d, f, g), inferior or simple design classic (?) Mesa Verde (Morris 1939, Pl. 295:b), and Black Mesa Black-on-white from northern Arizona (Morris 1939, 203, Pl. 296:a). The majority seems to be Mancos in style, which increases my worry as to the paint on the Mancos Canyon material. Yet these specimens illustrated from the La Plata district have a Mesa Verde appearance as well, and might, if thick and smooth, be Mesa Verde with early style design. Furthermore, there seem to be some Mesa Verde Black-on-white specimens among the Early Pueblo III vessels illustrated without statement as to paint type (Morris 1939 Pl. 292:w-b; 299:m, 300:a-c).

Definition of McElmo Black-on-white as identical with Mancos except for carbon paint, however, would be pointless; it would be far simpler to say that Mancos is sometimes decorated with carbon instead of iron paint, unless there are other consistent distinctions, such as rock temper. In any case, the type of paint used may not be as good a criterion as it has been considered. I have seen sherds of undoubted Mesa Verde which certainly look like iron paint; and the statement has been made that both the Mancos and the McElmo-Mesa Verde material from the Wilson or Monument ruins on Bug Point are alike iron paint (Leh 1942, 290-291).

The first use of the term "McElmo Black-on-white" (Gladwin 1934, table Fig. 6) was not accompanied by a description, but placed it as early Pueblo III, between Mancos and Mesa Verde, and referred to the published illustration of "proto-Mesa Verde." The text accompanying this illustration described so-called proto-Mesa Verde as unspecialized Mesa Verde; the same shapes and essentially similar pottery, but with steeper sides, less square rims, less exterior decoration, and less involved interior decoration (Kidder 1924, 67). As has been mentioned, this illustration probably includes mainly Mancos and is of pottery from a site which yielded classic Mesa Verde.

Kidder's term "proto-Mesa Verde" actually referred primarily not to pottery but to architecture, to the unit-type pueblo, and Kidder defines Mesa Verde generally by architecture rather than pottery (Kidder 1924, 65). Kidder points out the "maturity" of the unit type, especially in kiva construction, and remarks that the pottery strongly resembles classic Mesa Verde, simply less specialized (less so than the most specialized, that is), but believes that "Prudden's original thesis, that the unit-type holds the germ of true Pueblo architecture," is correct (Kidder 1924, 67). Morris says, "It is now evident that the unit-type house, while exemplifying a basic germ of architectural growth, is not, the best-known and most frequent representatives, by any means early" (Morris 1939, 114).

As a matter of fact, Prudden never said it was. Instead, he pointed out the virtual identity between artifacts found in unit-type ruins of the McElmo and Montezuma drainages and in Mesa Verde cliff dwellings, and carefully left open the question of relative age (Prudden 1914, 58; 1918, 46, 49), though explaining many of the larger ruins as compounded of units. So far as the illustrated pottery indicates, two of Prudden's sites were full Mesa Verde (Prudden 1914, Pl. V; 1918, Pl. IV and Fig. 12), and one was Mancos and McElmo style (Prudden 1914, Pl. II and Fig. 9).

The original basis, then, of so-called McElmo Black-on-white was architectural, that is, the pottery found in unit-type pueblos. This pottery was largely perfectly good Mesa Verde, perhaps lacking certain specializations. The name was applied later, on the basis of sherd survey, and thought to indicate a separate phase anterior to classic Mesa Verde.

Martin, following Gladwin on pottery type names, listed, among types at Lowry, after Mancos, Red Mesa, and "Wingate" Black-on-white, and before Mesa Verde Black-on-white, "/7/ McElmo Black-on-white /formerly called 'Proto-Mesa Verde,' Kidder, 1924, p. 67/" (Martin 1936, 80), and describes or defines no type except Mancos Black-on-white. He illustrates twelve so-called McElmo specimens, of which four correspond to the group of possibly transitional sherds I have described from Site 1 in Mancos Canyon as McElmo style (Martin 1936, Pl. CI, CIV:2, CV), three look like Mancos, possibly with carbon paint--(Martin 1936, Pl. XCVI:1, C:1, CIV:1); and five seem to be inferior or simple design but classical Mesa Verde (Martin 1936, Fig. 37a, Pl. CII, CIII).

In his next publication, Martin mentions nine so-called McElmo sherds at the latest of the four sites covered--". . .late Pueblo II, circa A.D. 1000"--with over 1000 sherds of Mancos Black-on-white (Martin 1938, 273), and says McElmo is a later pottery which grew out of Mancos (Martin 1938, 295). In a third major publication on the Ackmen-Lowry district we find the following outline (Martin 1939, 460-465): Pueblo I, 860-950, and Pueblo II, 950-1050--indented-corrugated and Mancos Black-on-white, ". . .towards the end of the period, the black-on-white becomes better made and better decorated. The characteristic designs (of) classic Mesa Verde pottery developed;" Pueblo III, 1050-1275, ". . .beautifully decorated black-on-white pottery with a glossy clear finish." The first quotation evidently refers to McElmo; the type is mentioned in this monograph only as occurring, with indented-corrugated and a little Mancos, at the Rim Rock Ruin of about 1050-1100 (Martin 1939, 477-480).

So far, "McElmo" is indicated to be an earlyish and unspecialized form of Mesa Verde, presumably carbon paint, of the eleventh century. Gladwin has placed it slightly later in recent publication, dating the so-called McElmo phase at 1180-1230, with classic Mesa Verde 1230-1280 (Gladwin 1942, 2). Whether this is based on tree-ring dates, and precisely what in intended by "McElmo," is not known; this dating seems to be largely for the purpose of showing that phases are fifty years long, and it could constitute merely a subdivision of developed Mesa Verde, on a typological basis, such as the quotation given above from Morris indicates to be difficult and uncertain.

Martin, on the other hand, has most recently given the following dates: Mancos Black-on-white, 850-1100 (he omits Piedra or any other local Pueblo I Black-on-white); McElmo Black-on-white, 900-1100; Mesa Verde Black-on-white, 1150-1300 (the 50 year gap is not accounted for); with the statement that McElmo occurs both with organic paint and with mineral paint (Martin and Willis 1940, 125)! Nine bowls and six mugs illustrated in this publication are captioned McElmo. The mugs and four bowls look like Mesa Verde, with early style, simple, or crudely done decoration. The other two bowls (Martin and Willis 1940, Pl. 61: 5, 6) seem to correspond to what I have been calling McElmo style, as do certain of the specimens illustrated as Mesa Verde Black-on-white (Martin and Willis 1940, Pl. 62: 7-9).

Usage of the term "McElmo" by the University of New Mexico has been no help either. The first description, based largely on Kidder's so-called proto-Mesa Verde, gives no differences from classical Mesa Verde except less exterior decoration and "large heavy designs," instead of "bold geometric designs," and placement in Pueblo II (Hawley 1936, 31-32), while Mancos Black-on-white is given as Pueblo III! (Colton and Hargrave sensibly omit McElmo from their 1937 compilation; and they give "proto-Mesa Verde" as a synonym for Mancos Black-on-white.)

The statements in the technical papers on Chaco Canyon work indicate that McElmo is thought of as carbon paint proto-Mesa Verde with heavy, simple broad line designs (Brand et al. 1937, 169; Kluckhohn and Reiter 1939, 50)--so far, so good--belonging in Pueblo II, around A.D. 950 (Brand et al. 1937, 86)--here we go again!

Occurrence in Pueblo I association is also stated (Kluckhohn and Reiter 1939, 26). Illustrations labeled McElmo, however, include unmistakable Mancos (Brand et al. 1937, Pl. XVI:b, XVII:c; Kluckhohn and Reiter 1939, Pl. 6:E, G, H, Pl. 9, Pl. 10:A), which is not mentioned in these publications (including Dutton 1938), as well as a few so-called McElmo style specimens (Brand et al. 1937, Pl. XVII:a; Kluckhohn and Reiter 1939, Pl. 6:F). One bowl, evidently simple-design Mesa Verde, is illustrated in both the publications on Bc 50; captioned McElmo in the first report and Mesa Verde in the other (Brand et al. 1937, Pl. XVII:b; Kluckhohn and Reiter 1939, Pl. 8:C).

This lengthy review of the double problem of McElmo Black-on-white--what do archeologists mean when they use the term? and, is there such a thing?--has probably clarified the subject very, very little. Possibly, however, the mere statement of the problem outlining the conflicting and confusing usages and the uncertainty as to a recognizable separate state of transition between Mancos and Mesa Verde of Black-on-white justified the excursus. I can offer no solution, save to recommend that the term "McElmo" be dropped, or else used for a design style rather than a pottery type, until something more is known about the actual development that occurred.

The need for thorough study of Mancos Black-on-white and Mesa Verde Black-on-white, with detailed stratigraphic work plus technological study, is obvious. Agreement on terminology, and greater conservatism in guess work as to dates and relationships of pottery types, would also be helpful.

There seem to be fairly definite indications that a distinct form of carbon paint pottery, decorated in what I have referred to as "McElmo style," occurs with Mancos Black-on-white as well as with Mesa Verde Black-on-white (while there are also pure sites of each of these two, but apparently not of McElmo), and that it may appear late in the occupation of Mancos sites, as suggested by stratigraphic results with a small amount of material at Mancos Canyon Site 1. The discussion by H.S. Gladwin of McElmo Black-on-white at Chaco Canyon (Gladwin 1945) indicates that, although much of my foregoing complaint is quite justified, the type does exist and is distinguishable on a consistent basis.

The situation is handled effectively and simply by Brew who says (1946, 285) that at Unit 1 of Alkali Ridge Site 13, "the pottery was partly Mancos Black-on-White and partly Mesa Verde Black-on-White. The Mancos was technically advanced and had begun to show Mesa Verde Features. The Mesa Verde was for the most part of the kind that could be called McElmo. However, the definitions of McElmo and the illustrated specimens labeled McElmo vary so that the safest procedure at present seems to be to call it early Mesa Verde."

The painted pottery illustrated from Site 13-Unit 1 (a structure which would be perfectly at home in Mancos Canyon, and which yields specimens that could equally well have come from Mancos Canyon) includes both Mancos style and so-called McElmo style black-on-white, but little if any classic Mesa Verde.

Martin and Rinaldo, however, consider (letters of February 4 and February 17, 1948) that "Mancos Black-on-white. . . .is Developmental Pueblo, Late Pueblo I or Pueblo II, but not Classic or Pueblo III. . . .McElmo Black-on-White replaces Mancos Black-on-White and Mesa Verde Black-on-White is derived from it." Obviously, we are using the same words for not quite the same things . In a very helpful conversation at Gila Pueblo on June 8, 1949, Deric O'Bryan showed me what he classifies as Mancos and as McElmo, on the basis of designs, shapes, and technical features, and indicated that he has stratigraphic evidence of sequential development, although the two overlap greatly in time. Much of my better-finished "Mancos" apparently is actually McElmo, as defined by Gila Pueblo; and my Site 1 is then a McElmo site. O'Bryan's important Mesa Verde monograph I expected would clarify this matter, when I wrote this much of this note in 1949. Two years later I must regretfully say that it does not. He gives (O'Bryan 1950, 99-100) perfectly good distinctions between Mancos and McElmo--which are also the distinctions between Mancos and Mesa Verde. He does not bring out the differences between McElmo and classic Mesa Verde, and regards McElmo as ". . .an intervening or bridging ware (type). . .helpful in explaining Mesa Verde Black-on-white which is highly standardized" (p. 99). Sizable sample lots of "McElmo" and "Mesa Verde" black-on-white sherds were furnished Mesa Verde National Park by O'Bryan; the park archeological staff and I examined these in December, 1950 and could not find any difference.

Gray Ware

General discussion: taxonomy

The local gray ware is predominantly rock-tempered (see Nordenskiold 1893, 78), as is found by Miss Shepard to be the case in the Johnson-La Plata district (Morris 1939, 277-278). This is a consistent distinction from Tusayan Gray Ware of northeastern Arizona, of the sixth to thirteenth centuries, which is reportedly sand-tempered throughout (Colton and Hargrave 1937, 190-202). Otherwise these gray wares, and Chaco Canyon utility pottery, are extremely similar and follow the same sequence of development, from plain through coil necks to allover corrugated.

Throughout the field and laboratory work, and the preliminary drafting of this report, I used the term "Lino Gray" (the first type in Tusayan Gray Ware) for the undecorated plain. After writing the discussion of ceramic classification, above, the fact had to be faced that a new ware with types paralleling those of Tusayan Gray Ware theoretically ought to be set up.

The type Little Colorado Corrugated, constituting Little Colorado Gray Ware, is separated primarily on the basis of sherd temper, other differences from Tusayan Corrugated being very minor (Colton and Hargrave 1937, 232.233). Regional differences in tempering of utility pottery are at least as important as are details of rim and decoration in painted ware. Re-defining Lino and Kana-a as tempered with either

sand or crushed rock would still require division into regional subtypes.

On the other hand, the name Lino Gray has been used not only for Chaco Canyon material (Brand et al. 1937; Kluckhohn, Reiter 1939), which is sand-tempered, at least at "Shabikeshchee" (Morris 1939, 277), but also for the plain gray of the Ackmen-Lowry district (Martin 1936, 1938, 1939), that of Alkali Ridge (Brew 1946. Description only of shapes), and for material as distinctive as the coarsely sand-tempered plain white of the Manuelito and Petrified Forest districts of the Puerco (Mera 1934, 7; Reed 1944a).

The only consistent difference is in the temper; setting up a new ware would--especially after the usages just cited--imply complete separation. The boundary between sand-tempered and rock-tempered is unknown; and some sand-tempered plain gray also occurs in the Mancos, probably locally made by the same people at the same time. A third dimension is needed in pottery classification, in order to group types simultaneously by objective criteria and by style or stage (see Colton 1943).

The only solution I can reach for handling the Mancos Canyon utility pottery is an evasion, simply description of the material under such headings as "plain gray." If an adequate taxonomy of Anasazi gray ware types is eventually worked out, the Mancos Canyon varieties can then be properly allocated.

Plain Gray

This constitutes, with a little of the black-on-gray (La Plata Black-on-white) derived from it, the pottery of the early component at Site 3 and of the deepest at Site 11; it is also common at Site 1, though not as a separate component, and occurs in small amounts at other sites. It corresponds to Lino Gray of northern Arizona except in the temper of most and the finish of some. Smooth surfaces predominate; much is semipolished (see "Lino Polished" or "Twin Trees Plain," described as a new type in O'Bryan 1950, 91, but as sand tempered). Fugitive red is clearly observable on much, but perhaps was never present on some of the best smoothed. Surface color is generally pale to dark gray, occasionally yellowish.

The core is generally dark gray, occasionally dark brown; generally quite coarse. The aplastic is generally crushed rock, seemingly andesite, plus a little mica (?) and quite a little sand (examination under the binocular microscope, checked by Stubbs). Igneous rock is characteristic in plain gray from Basket Maker III pit houses on the Mesa Verde (Lancaster and Watson 1943) and on the La Plata (Morris 1939, 277). Some of the crudest and roughest plain gray from the Mancos Canyon sites seems to be tempered with coarse quartz sand only. Some approximates Rosa Gray Ware, discussed in the next section. The semipolished gray occurs especially in genuine Basket Maker III association at Site 3, and is also represented among the 30 plain sherds from Site 4.

The material from Site 1 is rather different--unpolished, with surfaces which are rough, bumpy, pitted, marked by scraping, occasionally with dragged temper, occasionally wiped (as by a bundle of grass), with traces of basket moulding (see Rosa Gray Ware), occasionally smeared as if by a cloth, occasionally very even but unsmoothed and sandy. This probably consists largely of body sherds of coil-neck vessels, but there are also plain rim and neck sherds.

Jars like 3/6 (Fig. 35, b) constitute the normal shape. A few bowl rim sherds like those of the companion painted type seem to be rough plain ware. A plate and seed jar or squash pot, evidently quite large, are indicated by one rim sherd of each. Wide-mouthed vessels and various other shapes illustrated from the La Plata (Morris 1939, Fig. 38, Pl. 180-198) are not recognizably represented. Seventeen plain gray jar rim sherds from Site 1, and almost all those from Sites 3 and 11, are from fairly large globular ollas, with a smoothly curving neck. The degree of curvature varies greatly, from a sharp curve up from an almost horizontal slope, to a slow curve of a relatively wide-mouthed jar.

There is considerable variation in detail of rim formation. Some rims are entirely simple, slightly beveled in many cases; some are lipped by bending the top outward and over, or, more often, by an added top coil overlapping the wall. One from Site 1 is doubly lipped--the added coil bent over--the interior side of the lip is thrice beveled by smoothing, like a series of fault scarps in the eastern California mountains. Two plain gray jar rims from Site 11 are of much smaller vessels, with a definite shoulder, forming a sharp break or carina on the interior, and a vertical neck.

Jar bottoms are flattened and thickened but smoothly rounded. Only one plain gray sherd, from Site 11, shows a flat bottom separated from the curve of the side wall by a distinct line inside and out. Handles are not well known from the plain gray material. One from Site 11 is vertical, of circular section, coming out from a rim.

The so-called fugitive red slip mentioned above is very common on exteriors of early gray ware vessels of the San Juan. This impermanent pigment, applied after firing, is believed to represent an Anasazi method of producing red pottery in imitation of Mogollon imports, a color otherwise unobtainable in Anasazi reducing atmosphere firing methods (Colton and Hargrave 1937, 193; Rinaldo 1941, 9). If, however, fugitive red gray ware and San Juan Orange Ware actually were manufactured by the same people, it is difficult to see how this theory would hold good. (See remarks on reduced firing, below.)

Rosa Gray Ware

Rosa Smoothed and Rosa so-called Black-on-white have been merely mentioned in print up through 1943, and stated to be friable and sandy (Mera 1935, 2). Full descriptions of the Rosa types are to be found in an important monograph published

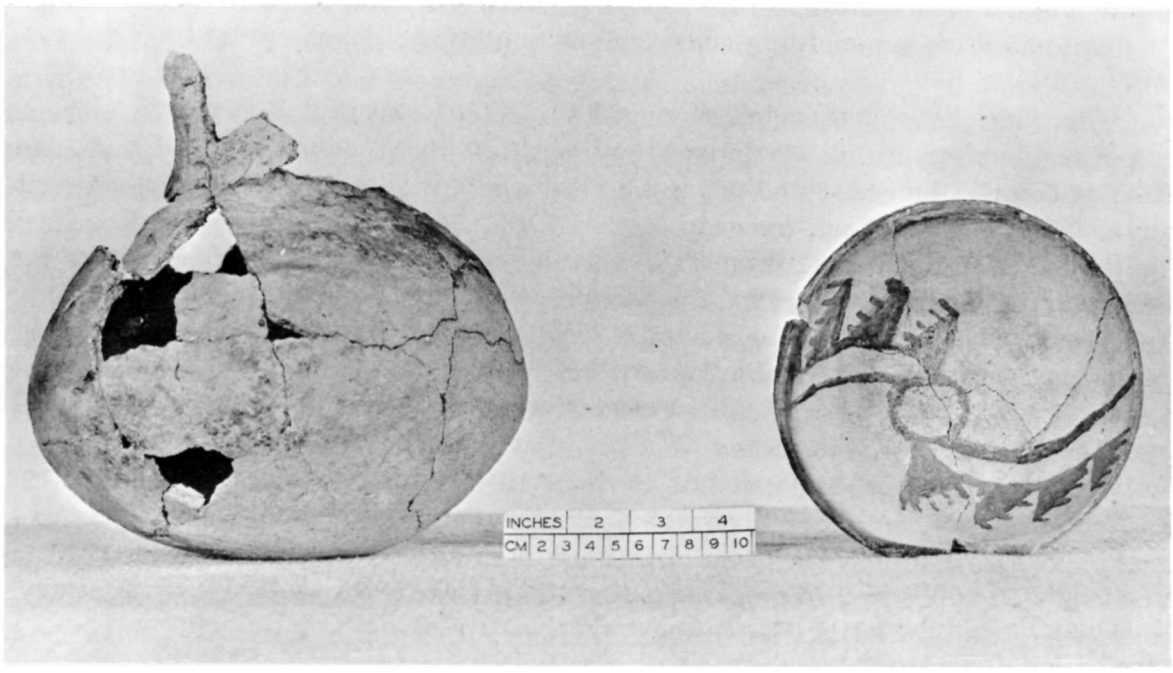


Fig. 47. Vessels of Rosa Gray Ware accompanying Burial 11/1.

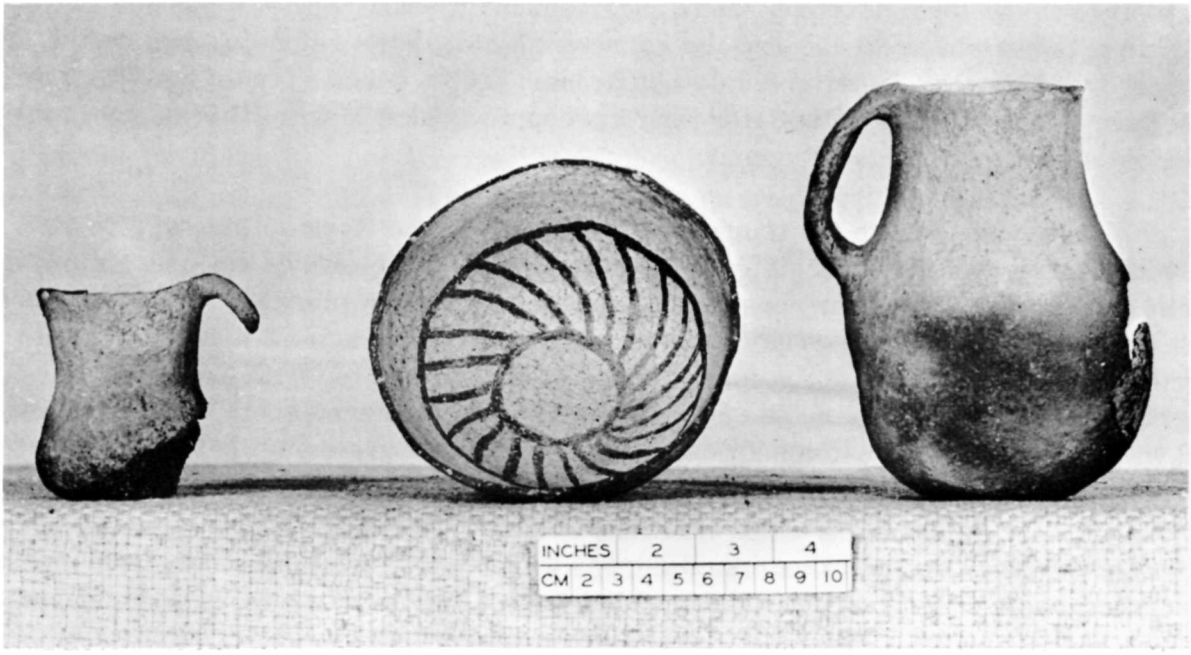


Fig. 48. Pottery accompanying Burial 11/3: two Plain Gray pitchers affinis Rosa; black-on-gray bowl of uncertain type.

after the original preparation of this report (Hall 1944). The paste is quite distinctive, and indications of basket-molding and careless wiping are characteristic.

The plain gray jars accompanying Burials 11/1 and 11/3 (Figs. 47a, 48), and sherds of another jar at Site 11, have been identified (by E. Boyd Hall and H.P. Mera) as Rosa Smoothed; the decorated brownish bowl which was the other accompaniment of Burial 11/1 as Rosa Black-on-gray (Fig. 47,b). Otherwise, strangely, Rosa types are quite scarce in the Site 11 material. Of the sherds so identified, one large jar has a vertical neck and abrupt shoulder, two rise in a very gradual curve, nearly vertical for 50 to 75 mm. (two or three in.), with no abrupt break. One of the latter bears horizontal encircling toolmarks, 40 mm. (1 1/2 in.) apart. Three other jar rims from Site 11 are Rosa pottery with unobliterated coils, very wide and flat with practically no overlap. Two are wide-mouthed (that is, slowly out-curving); one neck turns abruptly up to the vertical and consists of three 13 mm. (1/2 in.) coils (see Hall 1944, Fig. 23 and page 24). Another brownish neck sherd with Rosa-like paste bears exuberant corrugation to just above the maximum diameter, with a plain lower body (see Morris 1939, Pl. 261: a; Holmes 1886, Fig. 241). No indented corrugated pottery whatever was found in Hall's Rosa sites.

Several sherds of the plain gray material at Site 3 were identified as technically referable to the Rosa type, but perhaps they can be regarded as representing one extreme of the normal local range, rather than classified separately. The little jars with Burial 11/3 also seem to me very little different from the normal local range; not of as distinctive a paste as the other Rosa material from Site 11. Whether the definitely identified Rosa material is to be considered intrusive from the east or as all representing a stage of the local development is uncertain in any case. The occurence of Rosa vessels with burials at Site 11 and the scarceness among the refuse sherds would suggest trade or some other special significance; the fact that a few of the Site 3 sherds resemble Rosa (which is dated later than I presume Basket Maker III to occur in the Mancos) suggests local development.

The evidence as to the temporal significance of the Rosa pottery at Site 11 is inconclusive, but not inconsistent so far as it goes. The sherds not associated with burials came from the lower part of the refuse, but I cannot place all of them with assurance in specific cuts. They occurred definitely with Pueblo I material, but I cannot state that they definitely did not occur in the deepest cut with Basket Maker III. Burial 11/1 was in the top of the remaining part of the damaged south half of the mound, and was itself damaged by the bulldozer; its associations are somewhat uncertain. Sherds found nearby form a late Pueblo I assemblage: Piedra Black-on-white, plain gray, and a little corrugated, La Plata Black-on-orange and a little Abajo Red-on-orange. Burial 11/3 was exceptionally deep, 6 feet below the surface of the mound, underneath a pure Pueblo I cut which yielded Piedra Black-on-white, a good deal of banded-neck gray and plain gray (largely from banded-neck vessels, probably), a little definite plain gray (neck sherds), and La Plata Black-on-orange. The burial obviously was put down from this level. No sherds were found in the same level with

the burial, which was in caliche (though no grave pit could be traced). The burial is typologically late, so to speak--extended at full length on the back, the child's skull showing clear lambdoid deformation. The decorated bowl accompanying the two gray pitchers is not of any specific type (Fig. 48,b). It suggests a very crude Mancos, and presumably may be considered Pueblo I though not true Piedra Black-on-white (see, however, Roberts 1930, Pl. 29:b).

The Rosa material at Site 11 apparently occurs, perhaps as trade, in Pueblo I contexts: Piedra Black-on-white, banded-neck and plain gray, La Plata Black-on-orange. The type sites of Rosa Gray Ware excavated in the Gobernador district yielded tree-ring dates ranging up to A. D. 875 (Hall 1944, Appendix E), which fits with evidence in other areas as to the time of Pueblo I.

Coil-neck varieties.

The simple banded-neck gray is the equivalent of Kana-a Gray (Tusayan Gray Ware), and corresponds to Kana-a in most characters except temper--the sherds examined show crushed igneous rock, while Kana-a Gray is described as sand tempered (Colton and Hargrave 1937, 195). A major difference, however, is in the variety of styles of treatment of the unindented coils. Only one style is described for Kana-a, and is characteristic in the west (at least as far east as Allantown, Arizona, on the Puerco): flat, moderately wide (5 to 15 mm.; around 1/2 in.) overlapping coils.

In the Mancos Canyon material the banding is variously treated (see Holmes 1886, Figs. 220-222). Styles include: coils smeared flat with junctures partly obliterated; coils flat, wide, no overhang; normal Kana-a style; narrow clapboard coils; excessively overhanging clapboards; nonoverlapped half-round coils, smeared coils producing a ribbed appearance. See Fig. 49. This variety of handling is approximately paralleled in the Johnson-La Plata district (Morris 1939, 159, Pl. 259: a-i), in Chaco Canyon, and in the so-called plain corrugated ware at Lowry Ruin (Martin 1936, 113).

The only shapes represented are pitchers and small jars, similar to the pitchers but wider-mouthed and lacking the vertical handle (see Morris 1939, Pl. 215-220). Pitcher handles, so far as known, are flat straps, welded on. Rims are formed by tapering out the topmost coil or by squaring or beveling it off, rarely by bending it forward and down.

Core and temper generally resemble closely the corrugated ware, being less coarse than most of the plain gray. Exterior surfaces below the banding, and interiors, are not certainly distinguishable from the Plain Gray, particularly the less polished plain (see Colton 1940; Kluckhohn and Reiter 1939, 15). However, outward indications of the structural coiling often appear below the neck portion on which the process is deliberately utilized ornamentally. Conspicuous scraping marks and indications of wiping (with a bundle of grass?) are not infrequent. No surfaces are as rough and coarse, with as much protruding temper, as in the crudest of the plain gray. Accordingly,

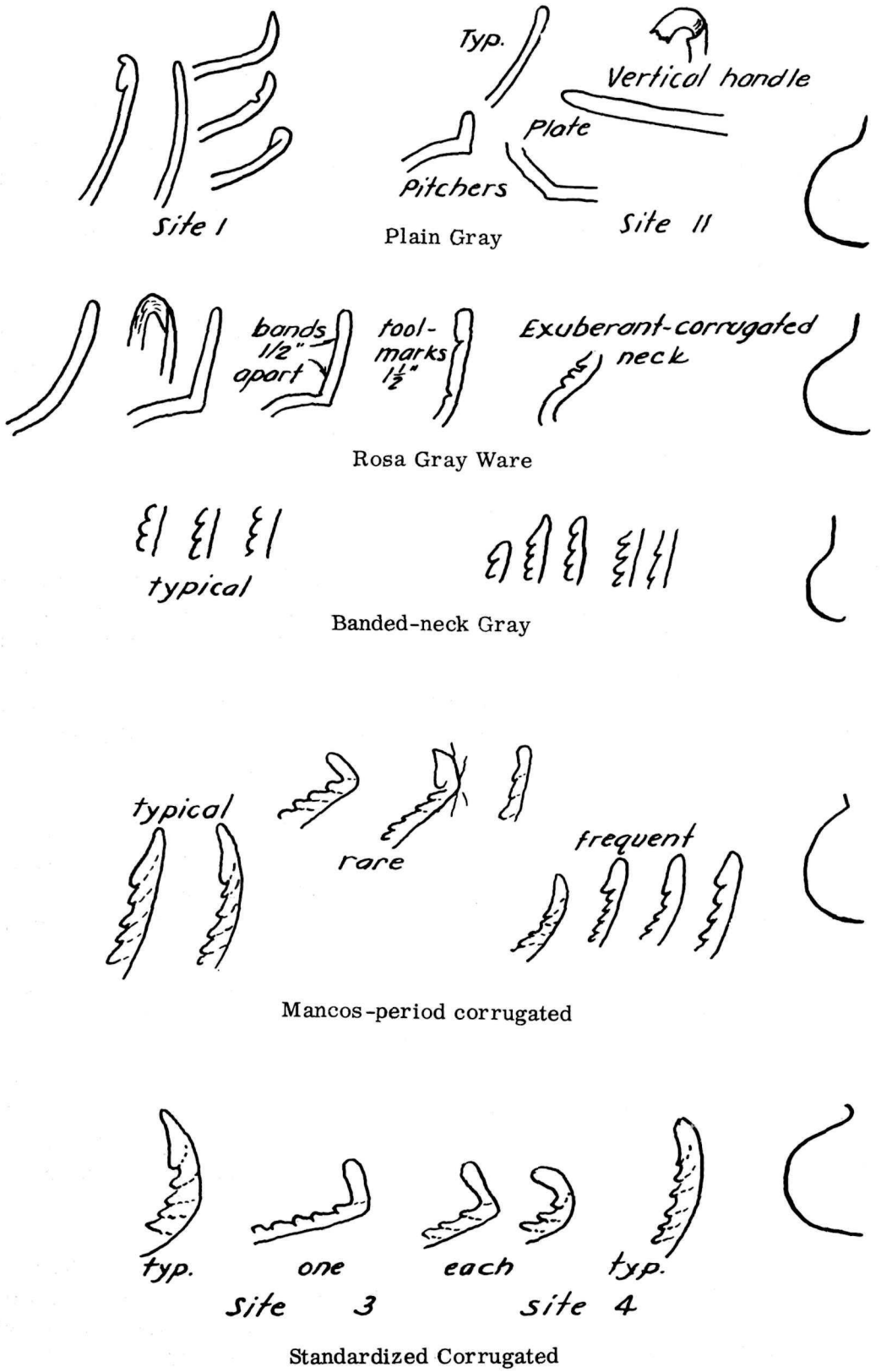


Fig. 49. Cross sections of utility pottery. Interior of profiles to the right.

the plain sherds from Site 1 described above as somewhat different from the Site 3 material in just those features, are believed to come largely from coil-neck vessels.

Tooled-coil banded-necks constitute a subtype equivalent to Coconino Gray (Tusayan Gray Ware), a type dated to the first half of the tenth century (Colton and Hargrave 1937, 201; Colton 1946, 253). The unobliterated bands are emphasized by channeling the junctures of the coils, presumably with a small stick. Nine sherds were found, not including the tool-marked Rosa Banded-neck sherds from Site 11 already mentioned.

Another subtype is banded-neck nail-marked. Three sherds from Site 11, of different vessels, are deliberately and decoratively incised with little curved lines presumably made with the fingernail. Two bear nail marks regularly and continuously along each band; one has small nail marks irregularly grouped on the rim coil only. A nail-marked rim and an incised sherd from Site 4 are discussed with the corrugated material because of the late type of lip.

Indented-corrugated necks should be considered a separate type because of temporal and typological significance, representing a brief stage, although generally minor in quantity. Obviously this is the last form of coil-neck, transitional to allover corrugated at least typologically, though it may have been manufactured at the same time as the first allover corrugated. The corrugated-neck type of Tusayan Gray Ware, originally named Coconino Gray (Colton and Hargrave 1937, 201; Colton 1946, 253) is called Medicine Gray and dated at A.D. 875 or 890 to A.D. 950 (Hargrave 1932, 12), immediately subsequent to Kana-a Gray (plain banded-neck) and anterior to Tusyan Corrugated, with no overlapping in time.

Corrugated-necks are as common as plain banded-necks at Site 1 and 4, where Pueblo I material seems to represent holdovers not constituting a separate component; and at Lowry Ruin (Martin 1936, Fig. 42, Tables pp. 108-111), where the same is true. They are rare at Site 11, which has an important Pueblo I component with an abundance of plain banded-neck gray. The only really good indented-corrugated neck from Site 11 is the exuberant style sherd of Rosa-like paste already mentioned.

Corrugated-necks apparently are uncommon on the La Plata, and are placed by Morris in his so-called Pueblo II (1939, 185), a transitional stage between Pueblo I and the Mancos period, segregated typologically, which he would date from about A.D. 875 to 930 or 975 (Morris 1939, 2-3). This accords well with Colton's dating of Medicine Gray, and with the approximate date of Red Mesa Black-on-white (Gladwin 1934, Fig. 4; Martin and Willis 1940, 141), an equivalent or local form of which seems to be the decorated type characteristic, along with late Piedra and/or early Mancos, of Morris' so-called Pueblo II (Morris 1939, Pl. 262:j, 264:a /?/, 265:d-i, 267 in part 268 in part).

No corrugated-neck gray is reported from Chaco Canyon, apparently (see Kluckhohn and Reiter 1939, 15), but one small vessel from an excavated but unpublished small site near Fajada Butte has the upper portion flat-banded, the lower part of the neck exuberant-corrugated, the body plain. The associated pottery consists of Red Mesa Black-on-white and plain banded-necks. A report on this ruin, the Three-C Site, has been prepared (Vivian n.d.b.).

The corrugated-neck gray from Mancos Canyon Site 1 includes both normal flat wavy indentation and few examples of careless, shallow indenting. One of the two sherds of this type from Site 4 is highly exuberant in style, the other flat wavy.

A three-rope vertical handle from Site 1, welded on, is on a corrugated neck sherd which seems to be of a vessel corrugated only to the waist; a two-rope vertical handle may also be. Simple handles, one circular in section and one flat, appear on corrugated-neck pitchers from Lowry Ruin (Martin 1936, Fig. 41).

Variable Corrugated

The 2700 gray ware sherds from Site 1 may be considered representative of the utility pottery of the Mancos period, phase, or focus. This includes 14 banded-necks and 14 corrugated-necks, and about 500 plain gray sherds, most of which probably come from coil-neck vessels. As there is no reason to suppose that culinary ware was kept unbroken much more successfully than table ware, coil-necks and plain gray may have been made in small quantitites after Pueblo I. Certainly they continued in use, at any rate.

That at least the corrugated-neck form was made in Mancos Black-on-white times is further suggested by the great variability of the allover-corrugated. (See Brew 1946, 281.) It includes flat wavy, and medium wavy (Martin 1938, 270), exuberant (Roberts 1935, 13) unindented clapboard, wedge point, partially smeared, smeared and flattened, square (Martin 1938, 270), and combinations of two of these styles--most often, a few unindented coils between exuberant and flat wavy. Flat wavy and medium wavy styles predominate. In refuse stratigraphy, general variability decreases upward; in particular, unindented clapboard decreases. Much of this style is very probably from banded-neck pitchers, which is indicated also by the excessive amount of plain sherds thought to come from such vessels. The effect of this on the proportion of plain banded-necks to corrugated-necks is discounted, as any number of the corrugated sherds could be from vessels with plain lower body. Medium wavy and wedge point styles increase somewhat in the upper levels.

The smeared corrugated has a sloppy, careless look, a far cry from typical flat wavy or exuberant. It is either very lightly indented or poorly done square indented. A few resemble so-called blind-corrugated of the Rio Grande, but the junctures between coils are seldom completely obliterated over an entire specimen (Kidder and Shepard 1936, 302-304; Shepard in Morris 1939, 279).

The flattened corrugated is generally smeared, lightly fingertip-dented. It resembles the western type Moenkopi Corrugated, but the coils are not as even and level (Colton and Hargrave 1937, 197). Combinations of flattened and square-indented occur.

True square-indented occurs, as well as square-smeared, separately as well as combined with flattened and with flat wavy.

The exuberant style corresponds to the type of corrugated commonest at Chaco Canyon. It varies from extremely deeply indented, positively flamboyant, to small and neat squarely-formed exuberant and wedge point, approaching the standardized corrugated. In addition there is a flattened exuberant or smeared wedge-point style, related to Martin's sawtooth type but giving the effect of continuous ridges of clay diagonally across the coils (see "Deadmans Corrugated," Hargrave 1932, 14).

All vessels are jars, generally quite large with wide mouth, ranging down to rather small with restricted mouth. Bottoms are flat. Rim flare and corresponding neck curve vary greatly. The lip is formed by an unindented coil, either the top coil more or less tapered out or an added overhanging coil. A smooth inner curve of the rim is normal, a wiped carina rare.

Specimen 1/20 (Fig. 50,b) is a good example of typical medium wavy style with flared rim, found among fallen roof material on the floor of Room H, Site 1. It is medium sized, 170 mm. (7 in.) high, 215 mm. (8 1/2 in.) in maximum diameter, and 108 mm. (4 1/4 in.) in inside diameter of the mouth. Walls average 5 mm. thick, coils average 3 mm. in exposed width, indentations average 9 mm. apart. Fingernail marks are, as often in this type, noticeable between indentations.

The corrugated pottery is rock-tempered, so far as checked. Interior surfaces resemble the plain gray.

Utility ware handles from Site 1 are flat strap horizontal, riveted, four with a flat or curving profile, one pushed in toward the vessel wall. There are three instances of pairs of little cone-shaped lugs, applied not far below the rim. There is one instance of a little clay rosette applied on neatly made flat wavy corrugation (see Nordenskiold 1893, Fig. 79).

Miscellaneous ornamental treatments include trailed lines through corrugation (three sherds); streaked smearing through corrugation, probably by a finger (nine sherds), not accidental (see Morris 1939, Pl. 272:d); corrugation smeared nearly flat within an incised triangle (one instance); set of parallel vertical tool marks across corrugation (one); and a sherd from Site 4 with typical flat wavy corrugated exterior and a single painted design on the rough gray interior surface of the rim.

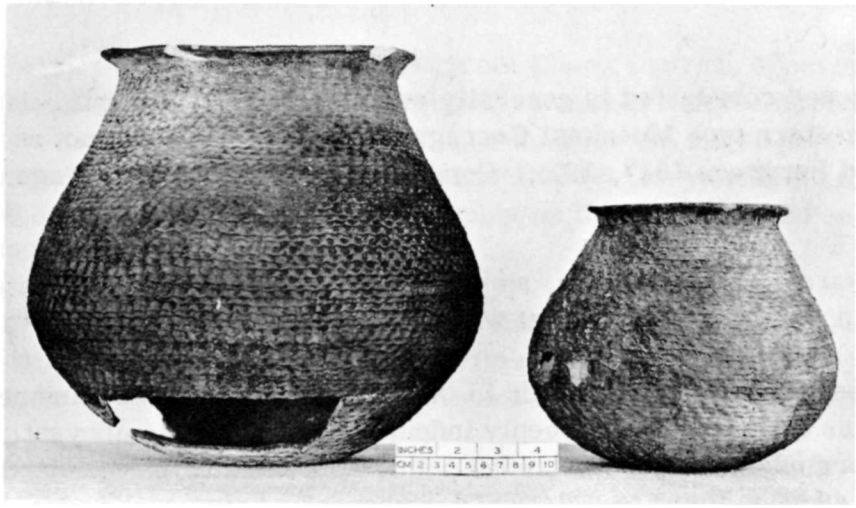


Fig. 50. Corrugated jars. Left 4/6, standardized style. Right 1/20, flat wavy of Mancos period.

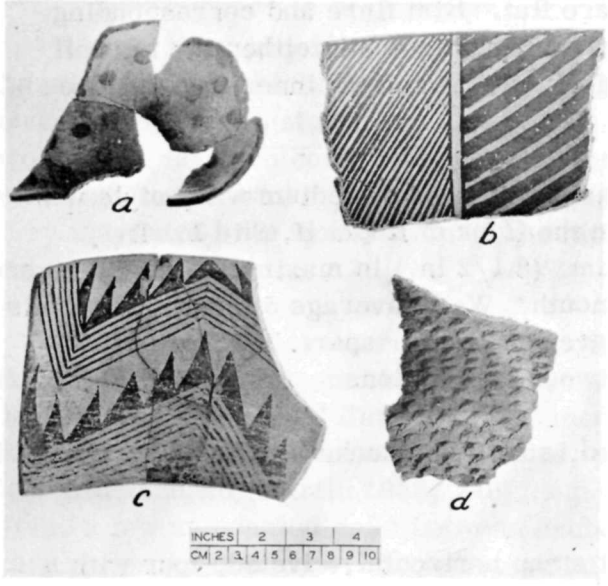


Fig. 51. Sherds from Site 7. a, Mancos Black-on-white, 7/14. b, McElmo-style Mesa Verde Black-on-white. c, Mancos (?) Black-on-white, 7/16. d, one of four large corrugated sherds, 7/15. a, c, d from Burial 7/3, b from kiva bench.

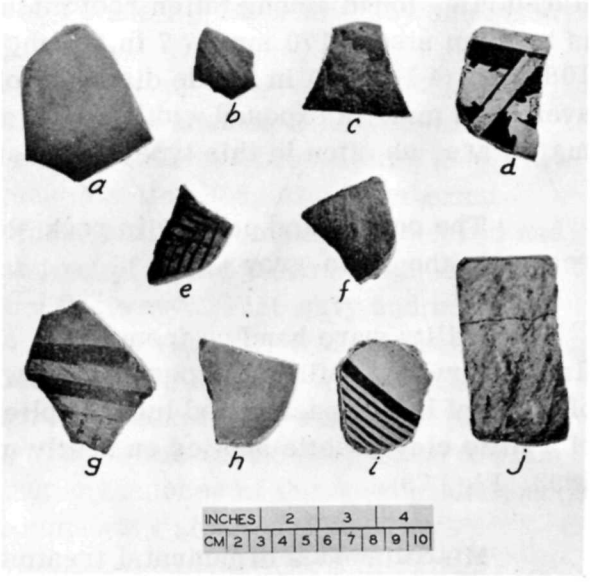


Fig. 52. Worked sherds from various sites.
a, Tusayan (?) Black-on-red.
b, Bluff Black-on-red, surface find at Site 17.
c, Piedra Black-on-white (actually red-on-gray).
d, f, Piedra Black-on-white.
e, g, h, j, Mancos Black-on-white.
i, Mesa Verde Black-on-white (Specimen 1/18).

Variants not involving indented corrugation but belonging to the same stage and too uncommon and-probably-unimportant to list as separate types include: from Site 1, two sherds of punctate gray ware (hollow circles, as with a reed stem); from Site 4, a rim coil with probably intentional finger marks, and an incised sherd with plain rim coil. The incised decoration of the last consists of a succession of parallel vertical short straight lines just below the rim. This would correspond roughly to O'Leary Tooled and Honani Tooled of Tusayan Gray Ware, dated at around A.D. 900. (Colton and Hargrave 1937, 200, 202); but the added-coil overhanging rim places it as not earlier than the Mancos period.

Standardized Corrugated

The indented-corrugated utility ware of the late component at Site 3, whose decorated pottery is classical Mesa Verde Black-on-white, is recognizably distinct from the Site 1 material just discussed. It constitutes a type, with variations, which I am refering to as "standardized" (see Brew 1946, 257). This material is characterized by narrow coils with neat, small, and regular indentation, and the jars are generally narrower mouthed. Clapboard, smeared, flattened, and exuberant varieties are missing. Incised or trailed lines, nail marks, smears and other similar decorations seem to be lacking. Double rosettes or small scrolls of clay occur, applied just below the neck.

There are three main styles of this standardized-corrugated of the Mesa Verde period, rather closely related. Fine wavy comes directly out of the typical styles of the preceding horizon, a refined flat or medium wavy. Cursive or long wavy is a variation of the same. Compact wedge point develops out of exuberant by shearing off or flattening the clay pushed up between indentations. Square corrugation also occurs.

No consistent difference in general rim type is observable, rims being generally more or less flared in the Mancos period as well as in the Mesa Verde period (contrast Gladwin 1934, 28). Truly vertical rims do not seem to occur in either. Mesa Verde, or standardized, rims are sharply recurved, often with a definite break; but this also occurs in the earlier. See Fig. 49.

The general shape of the jars differs slightly, those of the Mesa Verde period being, so far as the present material indicates, larger and of greater diameter in proportion to height and to width of mouth.

Jar 4/8, from a floor pit in the corner of room C, Site 4, is a good example of the Mesa Verde-type standardized-corrugated, with sharply flared rim, of the fine wavy style (Fig. 50, a). It is large and relatively wide, 255 mm. (10 1/2 in.) high, 290 mm. (11 3/4 in.) in maximum diameter, 170 mm. (6 3/4 in.) in inside mouth diameter, with walls 6 mm. thick, coils 4 mm. wide, indentations 7 mm. apart.

Temper and interior surface do not differ from the earlier types of corrugated ware, so far as known (see Shepard in Morris 1939, 277-279).

Individual sherds often could be classified as either variable or standardized, but groups from different sites or levels generally seem to be readily distinguishable as one or the other. The corrugated ware at Site 4, where Mesa Verde Black-on-white preponderates over Mancos, is predominantly of standardized styles. That at Site 7, preponderantly Mancos, is variable with little representation of standardized styles.

The black-on-white pottery later than Pueblo I from Site 11 includes approximately equal amounts of Mancos and good Mesa Verde, plus about half as much inferior Mesa Verde or so-called McElmo; the indented corrugated pottery from Site 11 includes exuberant and compact wedge point, flat wavy and neat medium wavy and fine wavy, with very little smeared, flattened, etc..

Similarly in the survey collection, Mancos and Mesa Verde Black-on-white are generally accompanied each by the appropriate type of corrugated pottery.

To the west, however, at Yucca House and in the McElmo drainage, Mesa Verde Black-on-white is associated with variable-corrugated and with coarse and careless square-indented corrugated. At the Hackberry group of Hovenweep National Monument, the corrugated is all square or squared exuberant, rather carelessly done and mostly very thick, with abundant coarse temper, the decorated pottery being virtually all Mesa Verde.

It is of interest to note that the development or degeneration of corrugated to a rough, bumpy gray, as in the Tsegi and Chinle (Colton and Hargrave 1935, 198; Haury 1945), evidently did not occur in the eastern Anasazi area. Instead, the utility ware is neatly indented-corrugated right up to the abandonment of the Mesa Verde region, so far as known. A few sherds of very thick plain gray from the Hackberry ruins are associated with similarly thick and coarse square-corrugated and with Mesa Verde Black-on-white, and are probably analogous to Kiet Siel rather than to Lino. From Alkali Ridge is reported a Pueblo III ". . .resurgence of plain blue-gray unpainted pottery. . .the paste seems to be the same as that of the corrugated ware. It is carefully smoothed but not polished" (Brew 1946, 257).

In the Rio Puerco-Mt. Taylor region, Mesa Verde Black-on-white is accompanied by normal corrugated utility ware; in the Galisteo Basin and other localities on the Rio Grande, the fourteenth century derivative of Mesa Verde Black-on-white is accompanied by the rough and poor Rio Grande utility types.

San Juan Orange Ware

General discussion

This is the one oxidized ware definitely indigenous in the northern Pueblo or Anasazi area, the region of the San Juan drainage; and it was evidently produced only

in the western San Juan and the Flagstaff district. The early group--the Alkali series, or so-called Montezuma Orange Ware--was manufactured in southeastern Utah. The late group, so-called Tsegi Orange Ware, which I propose to call the Tsegi series of San Juan Orange Ware, was made in the Kayenta district of northeastern Arizona. Black-on-red slipped types connecting these are distributed over a much wider area, and may have been locally manufactured all the way from southern Utah to Flagstaff. The continuity between these groups appears to be unquestionable and generally acceptable (Reed 1944d; Colton 1946, 23; Brew 1946, 296).

Otherwise all oxidized pottery (red ware or brown ware) found in the San Juan area may be considered as intrusive trade material; broadly speaking, of Mogollon derivation, from San Francisco Red at A.D. 475 to late forms of St. Johns Polychrome 800 years later. In the eastern San Juan, the Chaco-Mesa Verde region, even the orange ware is intrusive from the west. The early Alkali series reached most of this area, as far as the Gobernador district to the east and the Manuelito district to the south, but in such small amounts south of the Hovenweep drainage that it surely was traded into those districts, not imitated in local manufacture.

Possible origins of the orange ware of the western San Juan are unclear. The earliest form, Abajo Red-on-orange, is far from primitive; well developed pottery, highly polished, it is distinctly superior to the Lino Gray and Black-on-gray with which it is found (specimens from Alkali Ridge, Utah, seen at Peabody Museum in 1933). The Alkali series decidedly is not an accidental variation from the gray ware Anasazi norm, by so-called overfiring, representing experimentation with an autochthonous new idea, as has been suggested (Roberts 1929-1939, 1940, 5; Hawley in Brand et al. 1937, 86, 166). Much later, in the Tsegi, orange ware and black-on-white were produced in the same villages, by the same women, and even--at least once--on the same pot (Beals, Brainerd, and Smith 1945, 131).

Haury infers a northward outpost of Mogollon culture and people reaching southeastern Utah (Haury 1940, 126). This is rendered untenable by the lack of other specifically Mogollon traits than the oxidized pottery; the undecorated gray ware found with it is perfectly normal Lino. An intermediate view is offered by Rinaldo: imitation by the Anasazi of Mogollon Red-on-brown (Rinaldo 1941, 9). Something like this would be satisfactory, except that the compromise is unconvincing when Abajo and contemporary gray ware are compared as to quality and finish. More acceptable as an Anasazi imitation of the superior Mogollon pottery is the application of so-called fugitive red paint after firing to gray pottery. Among the possibilities offered by Brew (1946, 292-293), I like the idea that unpainted oxidized red-slipped pottery spread north from the Mogollon area, and became decorated first in the north.

An unusual, even unique feature of San Juan Anasazi ceramics is the use, from the beginning, of firing methods which produced a so-called reducing atmosphere--or at least, incomplete oxidation--and yielded gray pottery (ranging from white and light

gray to dark blue-gray, with a degree of oxidation giving some creamy or brownish-gray ware, especially in the early phases) with only black painted decoration (often partially oxidized, or else refired, to red brown).

These results may have been obtained by firing of pottery in kilns--bottle-shaped dug pits, such as found by Morris and reproduced by Anna Shepard (Morris 1939, 111-112 and 263-266). A similar pit was excavated by J. L. Nusbaum in February, 1926 at Step House in the Mesa Verde. Very possibly such pottery kilns are to be found at many other San Juan Anasazi sites, but have not generally been recognized. Miss Shepard also found that a fire of juniper wood heeled around and over the vessels generally yields gray (reduced) pottery, which is a simpler explanation.

An important inference is to be drawn from the difference in firing methods between north (Anasazi) and south (Mogollon and Hohokam), a distinction which is apparently constant prior to the 700's, and which is marked, though not complete and consistent, between A.D. 775 and 1275; a point which I think has not been fully brought out. That inference is, that contacts between Anasazi and Mogollon were not intimate and sustained, but rather were sporadic and largely indirect. Cultural influences, mutual interchange of ideas, must have consisted largely of stimulus-diffusion, with occasional importation of objects, and with very little penetration of groups of people or individuals any great distance into territory of the other cultural division. With reference to the one northern phenomenon which has on occasion been seriously regarded as perhaps due to an actual Mogollon colonization--the early San Juan Orange Ware of Alkali Ridge in southeastern Utah--the effect of this is to reinforce the view that it is indigenous there and not to be ascribed to Mogollon influence.

Bearing in mind the considerations mentioned above and the general picture of cultural criteria and classifications in the Southwest which I have been trying to advance for the last several years (mss. 1942-43, correspondence and discussions at the time and 1946-48, and published papers: Reed 1942, 1946, 1948), it does not seem to me puzzling or startling that a group of San Juan Anasazi, well north of Mogollon territory, should develop a red ware and use both oxidizing and so-called reducing techniques of pottery firing. (Nor is it really surprising, I suppose, that the other Anasazi subdivisions did not do so being more conservative in this respect for no particular reason.)

The explanation I envision is a story on these lines: (1) In the 400's knowledge of the existence of pottery and of the fundamental idea of pottery making spread to the San Juan Anasazi from a Mogollon group; (2) from late in the 400's onward, the former made grayish pottery, some of it slightly oxidized, perhaps because of firing in loosely stacked heaps of wood; impermanent so-called fugitive red slipping of vessel exteriors reproduced the appearance of well-oxidized Mogollon vessels (San Francisco Red), as is generally agreed; (3) the idea of painted decoration (black-on-white) arose almost immediately, whether an independent inspiration or derived, indirectly or directly, from another source (which would necessarily be Hohokam; there seems to

be no evidence of painted pottery being early in Mogollon--see discussion, and references cited, in my paper on "Dating of Early Mogollon Horizons" (Reed 1948b); (4) unintentional oxidation (overfiring) or, perhaps more often, accidental re-firing (--not that they are likely to have burned a house down, the roast pig technique, every time a red vessel was desired), produced numerous so-called La Plata Black-on-white bowls which are acutally red-on-cream, through oxidation of the iron paint and of the iron paint and of the buff-burning clay (Shepard in Morris 1939, 250), such as a restored specimen from the 1926 excavation at Step House in the Mesa Verde (J. L. Nusbaum in O'Bryan et al., in prep. 1949); (5) this sometimes happened--just once might be enough--to a black-on-white bowl which chanced to be made of the red-burning clay sometimes used (Shepard in Morris 1939, 250), producing--a red-on-orange!

The lady likedit, and one group or just one community, or perhaps at first only one family--began deliberately over-firing vessels made from a certain clay source and decorated with iron paint, although plain gray (Lino) continued to be made in the same way as before--which suggests that the technique used for oxidized-firing was, or seemed to be, an additional effort rather than a simplification. The occasional use of buff-burning clay like that normal in black-on-white ware yielded occasional grayish orange ware (Shepard in Morris 1939, 250; Brew 1946, Fig. 101: s, t, u, v, and p. 254-255; some of the so-called Abajo Black-on-gray however, is evidently not even this distinct--certainly not a separate type in any case--but merely under-fired, insufficiently oxidized).

The same general kinds of clay, temper, and paint, and the same techniques of manufacture, other than firing, apparently were used in the production of Abajo Red-on-orange and of La Plata Black-on-white and northern Pueblo I black-on-white; this fact, and the accompanying Lino Gray, and the close similarity to other northern material (San Juan Anasazi) in all other categories of Alkali Ridge remains, convince me completely that San Juan Orange Ware is purely autochthonous in southeastern Utah, with only a minimum of possible inspiration by Mogollon imports, and that it first appeared through some such sequence of events as I have outlined above. Once established, San Juan Orange Ware was variously modified by later developments--manganese paint, red slip, etc.

The exceptionally smooth surface finish and the distinct design system of Abajo Red-on-orange remain to be explained. As to the first, I can only suggest that the potters who manufactured Abajo Red-on-orange were proud of their handiwork and polished it more assiduously than did contemporaneous producers of black-on-white types. The matter of decoration is partly answered by Brew's comparison to Basket Maker II and III basketry designs, though this, in giving the source of the decorative system, does not answer the real question of why it differs markedly from that of the black-on-white pottery, which is also supposed to derive from basketry. Although there is some overlapping with Piedra Black-on-white (Brew 1946, 254;

Morris 1939, 182), the general effect normally is sufficiently distinctive that red-on-orange bowls or sherds can be instantly recognized among black-on-white in uncolored illustrations before referring to the caption. As yet I do not quite know why this should be.

The Alkali series is associated with tree-ring dates grouped about A.D. 775 at Alkali Ridge (Brew in Martin 1939, 491; Stallings 1937, 3; Brew 1946; Stallings: A.D. 760+10 to 768+10; Gladwin: A.D. 765+x to 771, 772, 777), of about A.D. 775 and 855-875 in the Ackmen district (Getty in Martin 1939, 495), and dates clustering from A.D. 850 to 875 in the Gobernador (Hall 1944, Appendix E). It occurs in "very late Basket Maker III" and, primarily, Pueblo I associations on the La Plata (Morris 1939, 156, 179-184, 192, 270-272). Other findings also indicate that all types of the group are roughly contemporary and occur in Pueblo I times, from perhaps A.D. 750 to perhaps 950.

Nevertheless, there is a distinct suggestion of successive development, in the order typologically probable, from Abajo through La Plata to Bluff and Deadmans, in the distribution and relative frequency of the types, both generally and in the Mancos Canyon material. There is a little stratigraphic evidence suggesting occurrence of Abajo Red-on-ornage in Basket Maker III association at Site 11 in Mancos Canyon.

Possibly the localization of these types is partly in space and partly in time, with considerable overlapping. Deadmans Black-on-red, also a Pueblo I type, which is not placed in the Alkali series, seems to be a localized development in the Flagstaff area, at the southwestern periphery of the Anasazi area.

These Pueblo I types hold on almost into Mesa Verde times, in use but probably not in manufacture, and two sherds of the general Bluff type from Site 4 represent a bowl which may have been kept unbroken for over two hundred years. They are found at Mancos Black-on-white sites as well as being abundant in Pueblo I sites, with the addition at the former of the late Pueblo II type of the same general ware, Tusayan Black-on-red, and in so-called McElmo times of Citadel Polychrome of the twelfth century. These seem to derive from Deadmans Black-on-red and are best known in the Flagstaff area, but are now believed to fall in this general orange ware sequence of the western San Juan (Reed 1944d; not indigenous in the Tsegi: Beals, Brainerd, and Smith 1945, 125).

Although well represented at Pueblo I sherd areas and Mancos period sites, the Pueblo I oxidized painted types are not sufficiently common in Mancos Canyon to suggest local manufacture, in contrast to the Ackmen-Lowry district (Martin 1938, 1939). La Plata Black-on-orange is the most frequent. As would be expected, this material is a little more abundant here in the Mancos than seems to be the case in districts further east of its source area, such as the La Plata (Morris 1939), Piedra (Roberts 1930, 138-139), Largo (Hall 1944), and Chaco (Brand et al. 1937; Kluckhohn and Reiter 1939)rivers.

The only trade sherd in the Basket Maker III component at Site 3 is unpainted orange of uncertain type; it is not of as good quality as most Abajo. Several sherds of Abajo Red-on-orange were found in the Basket Maker III level at Site 11. La Plata Black-on-orange and Bluff Black-on-red were frequent at Sites 1, 7, and 11, and at Pueblo I sherd areas. Abajo Red-on-orange was also found at Sites 1 and 11, in much smaller amounts.

Tusayan Black-on-red, dated at A. D. 1050-1150 (Colton 1946, 253), was found at Site 1 in some quantity; Citadel Polychrome, dated at A. D. 1075-1175 (Colton 1946, 253) only as three sherds in the uppermost levels of Site 1.

The late development of this orange ware sequence, Tusayan Polychrome of the twelfth and thirteenth centuries and its late thirteenth century variants, is not represented in the material from Mancos Canyon.

Taxonomy and technology

Complete descriptions of types will not be attempted, but merely identifying statements, references, and discussion of problematical matters.

Abajo Red-on-orange (Brew)

Name used by Martin 1936, 80, and 1938. See Martin 1939, 431-432, and Brew in Martin 1939, 489-490; Shepard in Morris 1939, 271. Described in Brew 1946. The sherds of so-called red pottery from Shabikeshchee might perhaps be of this type (Roberts 1929, 117).

Synonyms: Montezuma Red-on-orange (Martin 1936, Tables pp. 104-111); Red-on-brown Ware (Guernsey 1931, 91; Gladwin 1934, Fig. 8; and Judd 1924, 409, fn. 14--". . . two brown bowls (324807, 324808), nicely smoothed on the insides, seem also to have been decorated with red paint").

Description: Red iron paint on unslipped, highly polished, orange surface; core gray or brown. The standard Abajo material from Alkali Ridge is tempered, according to Shepard (Morris 1939, 271), with sand and friable rock. That from Sites 1 and 11 in Mancos Canyon is rock-tempered and differs from the associated Black-on-orange only in paint type (examination of all sherds under the binocular microscope, at 39 diameters and at 80 diameters, by the writer and Stanley Stubbs). The few iron paint, red-on-orange, sherds found in the La Plata district similarly are tempered with andesite like the Black-on-orange (Morris 1939, 271). Design system described and analyzed in Brew 1946.

Six sherds of Abajo were found at Site 1, high as well as deep in the refuse; six at Site 11, primarily in the Basket Maker III level; a few in surface collections: two each from a Pueblo I sherd area and a Pueblo I-Mancos site.

Subtype: Abajo Polychrome (Brew). See Martin 1939, 431 and 432; Morris 1939, 184 and Pl. 1d; Brew 1946. Both red (iron) and so-called black (manganese) paint, otherwise as above. Not found in Mancos Canyon work.

La Plata Black-on-orange (Martin)

Described by: Morris 1939, 156, 179-184, and Shepard in Morris 1939, 270-272.

Named: Martin 1939, 432.

Synonyms: Pueblo I Black-on-red (Roberts 1930, 183-139; Morris 1939; probably Guernsey 1931, Pl. 3, 15, 61); Sandstone Black-on-orange (Hawley, in Kluckhohn and Reiter 1939, 49-50).

Stage: Pueblo I. Applicable tree-ring dates: two Ackmen sites, 768 plus x and 855-872 (Getty, App. D in Martin 1939).

Description: Brownish manganese paint on unslipped, well polished orange surface; core gray or brown. Crushed rock temper (andesite), with a little sand.

Ten sherds of La Plata Black-on-orange from Site 1, plus six undecorated, probable; thirty from Site 11, plus twelve undecorated unslipped orange ware.

New subtype: Unnamed, as the differentiae may not occur together consistently. Paint: especially dense black, not polished over. Surface: bright orange, especially well finished. Temper: angular quartz, waterworn quartz sand, crushed andesite, and basalt grains.

Specimens: Two sherds from Site 11, which were at first thought to be slipped and sherd-tempered, but do not appear under the binocular microscope to be so. The bright, very smooth surface is within the color range and finish range of La Plata Black-on-orange; the paint is extraordinarily heavy but resembles that of La Plata, save that it was not polished after application and the edges are quite sharp. One orange sherd from Site 1 lacking decoration belongs with these as to temper and surface.

New subtype: La Plata Black-on-orange with red-slipped bowl exteriors, typologically intermediate between La Plata and the next type or subtype discussed. Interiors of bowls as in La Plata, exteriors thinly slipped. Paint light brown (manganese). Tempered with ground sherd and rock.

Specimen: One large rim sherd from Site 1.

La Plata Black-on-red (Hitherto used more or less interchangeably with the term La Plata Black-on-orange.)

See descriptions of Bluff Black-on-red in Hargrave 1936, and Colton and Hargrave 1937, 69-72, and pertinent discussion below. A group of sherds virtually constituting a red-slipped subtype of La Plata is treated here preceding the discussion of the Bluff and Deadmans types.

Red wash applied on the decorated surface, and generally on bowl exteriors; otherwise similar to La Plata Black-on-orange. Rock tempered. Slip not readily distinguishable in cross-section, but unmistakable on surfaces.

Evidently occurs in the Piedra, at least one vessel (Roberts 1930, 139) and on late (so-called Pueblo II, or about A.D. 950) examples in the La Plata district (Morris 1939, 193 and 270; Pl. 269:b).

Six sherds from Site 1, plus eight undecorated, probable; two from Site 4 (one undecorated, uncertain); fifteen from Site 11 (including four undecorated); for black-on-red sherds from Site 1 and 7, see the following discussion.

Bluff Black-on-red is unslipped according to Colton and Hargrave (1937, 69-72), surprisingly. Hawley specifies (Kluckhohn and Reiter 1939, 50) for so-called Sandstone Black-on-orange (an unnecessary synonym for La Plata Black-on-orange) a thin orange slip, which is undoubtedly incorrect, and states that Bluff has "a thicker, redder slip." The material just discussed can best be called La Plata Black-on-red, and thought of as a late form or subtype of La Plata Black-on-orange.

Bluff (Hargrave) and Deadmans Black-on-red (Colton)

Bluff and Deadmans are discussed together because of the difficult problem of the relationship between them, and because of the occurrence of subtypes or sherds intermediate between them and/or varying in one or two characteristics from the formal type descriptions by Colton and Hargrave. Their handbook states that direct comparison with type sherds of Deadmans is desirable to distinguish Bluff with certainty (Colton and Hargrave 1937, 74); and Hargrave originally stated that Bluff and Deadmans could be distinguished only by "critical examination" (Hargrave 1936, 33).

Numerous minor differences are listed by Colton and Hargrave, however: Deadmans more highly polished, with glittering specks more noticeable on the surface; Bluff with bumpy, pitted, and crazed surface, walls of greater and more variable thickness; Deadmans with richer paint, better executed designs--narrow lines and hachure more frequent, solid elements smaller, angular patterning, curved stripes rare, encircling lines below rim.

These are all relative, Deadmans being of superior quality. Definite distinction seems nevertheless to be provided by style of design, by the cruder execution in Bluff, with large solid elements in curvilinear arrangements, curved stripes, and without encircling lines and fine line work. Both are described as unslipped and tempered predominantly with quartz sand.

There are two type sherds of Deadmans Black-on-red at the Laboratory of Anthropology, furnished by the Museum of Northern Arizona about ten years ago. One is definitely slipped, and is tempered with crushed rock (either feldspar or tuff; see discussion under Tusayan Black-on-red). The other is perhaps unslipped, tempered with andesite like La Plata Black-on-orange. Both contain also a little basalt (as stated by Colton and Hargrave) and waterworn quartz sand. Other sherds presumably of so-called true Deadmans Black-on-red, in Laboratory survey collection from the immediate vicinity of Flagstaff, seem, although not examined under the microscope, to be mostly andesite-tempered and probably slipped.

Of eight sherds of San Juan Orange Ware of so-called Pueblo I Black-on-red from the large pueblo on Montezuma Creek, Utah, at the mouth of Coal Red Canyon, one is true Bluff, corresponding in almost every detail to the published type description--it is poorly polished; thick and of variable thickness; the surface bumpy, pitted and crazed, without glittering particles; the decoration curved striped in typical manganese paint. It is unmistakably slipped. Another approaches Deadmans in quality, but lacks glittering particles and high polish; two are similar to the group previously described, essentially La Plata Black-on-orange but with a thin red wash; the other four are unslipped Lab Plata Black-on-orange.

Five black-on-red sherds in collection LA627, from Lowry, are of the Bluff-Deadmans stage: black manganese paint on thin but even red slip, very well polished, designs similar to Deadmans style, andesite temper with a little basalt. One contains sherd temper also, with less rock (microscopic examination by Stubbs). Martin lists only Wingate, Puerco, and Tusayan as black-on-red types occurring at Lowry Pueblo (Martin 1936, 80), and for smaller, earlier sites nearby "black-on-red pottery from the Kayenta region (probably Deadmans Black-on-red)" (Martin 1938, 276).

Twelve orange ware sherds from Mancos Canyon Site 7 are red-slipped and rock-tempered (andesite plus quartz and basalt). Three are tempered with ground sherds as well as crushed rock. Six bowls have a good red slip, both surfaces well finished, dense black paint; two of these (including one with sherd temper) are close to Deadmans in style of decoration, one is definitely of so-called early style (Bluff-La Plata style, curvilinear, solids). Two bowls are poorly finished, though thinly slipped on both sides; both are so-called early style with heavy spirals; one is rock-tempered withlight brown surface, the other tempered with sherd and rock, decorated in this brown paint on a thin pinkish slip. Two jar sherds (an olla shoulder and a seed jar rim) lack decoration.

Ten of the black-on-red sherds from Site 1 seem to be neither the La Plata or so-called inferior Bluff Black-on-red, described above, nor Tusayan Black-on-red. Two of these, very well finished and decorated, strongly resemble Deadmans, although they lack glittering specks conspicious on the surface, and were tentatively so identified by Colton during a visit to Santa Fe in April 1942. Both are andesite-tempered and thinly but definitely slipped. Eight resemble Bluff in general effect, as Colton stated on examinging them. They are not, however, particularly bumpy, pitted, or crazed (like the example from the Coal Bed Canyon Site, for instance). All seem to be thinly slipped. Five are tempered with sand and rock (which fits the descriptions of Bluff and Deadmans), three with sherd and rock.

There seems to be a stage of black-on-red-slip pottery, typologically advanced over La Plata Black-on-orange and probably derived from it, as is suggested by the subtype of La Plata with red slipped exterior, but also occurring within Pueblo I times, in which quality of finish and style of design vary quite a little and the tempering is crushed rock, ground sherd and rock, or quartz sand and rock. Rather than split this material into local (?) types on the basis of these differences, I would suggest liberalizing the description of Bluff to include all of it, except possibly a specialized local form common only in the Flagstaff area, Deadmans Black-on-red, distinguished by superior quality, style of design, and minor details.

Both the inferior material described above as La Plata Black-on-red and the more advanced (though quite possibly contemporaneous) sherds just discussed would then be classified as Bluff, primarily on the basis of designs similar to those of La Plata Black-on-orange, curvilinear and solid, despite great variation in quality and considerable variation in temper. Variability in temper seems to correspond with superior finish. Subdivisions could be made later, if needed, after more thorough study of larger amounts of material from more different areas. The sherds of high quality which have been considered in this section, rather than under the preceding description of La Plata Black-on-red, are listed in the summary of ceramic composition of sites at the beginning of this paper as "Bluff affinis Deadmans."

The reported so-called Deadmans Black-on-red from small sites near Lowry, and from Chaco Canyon and other easterly sites, is very likely from the Kayenta region at the furthest and probably should be called Bluff, or Bluff affinis Deadmans, or something else.

My restrictive definition of Deadmans is supported and clarified by Colton's recent repetition of evidence that it was manufactured in the Flagstaff district (Colton 1941, 32). More positive evidence of local production is presented (Colton 1941, 32) for Medicine Black-on-red, an approximately contemporaneous type (Colton and Hargrave 1937, 72), though tuff temper is somewhat questionable in the case of Tusayan Black-on-red (see below) and consequently may be for this type also. I have no sherds from Mancos Canyon referable to Medicine Black-on-red; it is probably quite rare or absent in the eastern San Juan, though it apparently occurs in Chaco Canyon (Kluchohn and Reiter 1939, 15; possibly Martin and Willis 1940, Pl. 14:7;

but see Beals, Brainerd, and Smith 1945, 10).

The connection of Bluff and Deadmans--and through them of Tusayan Black-on-red and Tsegi Orange Ware--with the Alkali series is indicated by similarity in many characteristics, overlapping in time and space, continuity of development, with many transitional specimens as in much of the material that has been discussed, and as in sherds found intrusive in the Rosa complex, of the Gobernador district in the ninth century (Hall 1944), which I saw in December 1941 and which I understand were identified by Brew as affinis La Plata, by Colton as Bluff.

Tusayan Black-on-red (Gladwin)

This is a familiar type, distinguished by hachured decoration (Dogoszhi style) and fairly thick red slip, dated at A. D. 1050-1150 (Colton 1946, 253). It was originally described as sherd tempered (Hargrave 1932, 21); the light colored angular fragments were later identified , by Joseph Berman of the University of Pennsylvania ceramic laboratory, as tuff (Colton 1941, 9, 33). It is my impression that another ceramic technologist (also working with material from the Flagstaff district, presumably) identified them as ground sherds.

Type sherds from the Museum of Arizona and survey sherds from the Flagstaff area, at the Laboratory of Anthropology, seem to be tempered with ground sherd plus sand and basalt. The similar piece of typical Tusayan Black-on-red from Mancos Canyon Site 4 is tempered with ground sherd and crushed rock.

Six fragments of four Tusayan bowls from Site 1 and Dipper 1/18 are tempered with light colored angular fragments which seem to be feldspar, and a little andesite. The material may be tuff of some kind rather than feldspar, but is distinctly different from the aplastic in pottery from the Jemez volcanic area known to be tuff tempered (this was pointed out to me by Stubbs during microscopic study of pertinent material). There are also two undecorated red slipped orange ware jar sherds, with this same feldspar or tuff temper; presumably they are of Tusayan Black-on-red vessels.

The large dipper, Specimen 7/18, is a variation of Tusayan Black-on-red (Fig. 37, a). The interior is normal; the exterior is unslipped orange save for a wide horizontal encircling stripe of red immediately below the rim and a similar band across the bottom from rim to rim. The bowl is 138 mm. (5 1/2 in.) in outside diameter, 70 mm. (2 3/4 in.) high; the walls average 6 mm. (1/4 in.) thick. The rim is simple and direct, rounded over (IA3). The hollow handle is 30 mm. (1 3/16 in.) in outside diameter, broken off--long before interment, evidently--only 25 mm. (1 in.) from the wall of the bowl.

This technically polychrome variation, with the exterior partially unslipped or slip-decorated, is presumably late, perhaps transitional to Citadel Polychrome. The subtype to which this specimen is similar, Tusayan Black-on-red with plain base,

was given as "later than Tusayan Black-on-red and is most common in early Pueblo III" (Hargrave 1932, 21).

A more striking related transitional form obviously is later than normal Tusayan Black-on-red: again the interior is normal hachured designs on red slip, but the exterior is decorated with black-bordered red bands on unslipped orange, identical with Citadel Polychrome bowl interiors. This is known to occur both at Wupatki in the Flagstaff district and at Marsh Pass (Reed 1939, 226-227; see Reed 1944d).

Dippers are apparently not recorded for the normal type. The other Tusayan Black-on-red decorated sherds are evidently of typical fairly large bowls; rims present are IA3.

Tusayan Black-on-red was fairly widely distributed in the upper San Juan, where it is considered intrusive; occurring on the La Plata (Morris 1939, 212, Pl. 301: h, j), reported at Lowry (Martin 1936, 80), perhaps at Aztec (Morris 1919, 71) and present though not commonly, in Chaco Canyon (Dutton 1938, 85; Kluckhohn and Reiter 1939, 15; no mention in Brand et al. 1937; represented among sherds from Pueblo Bonito).

Citadel Polychrome (Colton)

A distinct and described type, or a subtype of Tusayan Polychrome, dated at A.D. 1075-1175 (Colton 1946, 253), Citadel consists of bowls with the exteriors wholly or partially red slipped, the interiors with black-bordered red bands on unslipped orange, well polished. The black paint is manganese as in the preceding types, the red of the interior decoration and the exterior slip hematite.

Citadel is tuff-tempered according to Berman (Colton 1941, 33). A sherd of this type in the Museum of Northern Arizona sample at the Laboratory of Anthropology is tempered with quartz sand and an unidentified kind of crushed rock, with a little basalt and possibly some ground sherd. The three sherds of Citadel Polychrome from Site 1 in Mancos Canyon are tempered like the Tusayan Black-on-red, with white material which is either feldspar or tuff, and a little andesite.

Probably part of the Tusayan Polychrome reported from Chaco Canyon and southwestern Colorado is actually of the Citadel variety (see Kluckhohn and Reiter 1939, 14, Table 2). Tusayan Polychrome proper, with unslipped orange exterior bearing neat encircling stripes in red below the rim and with more complex interior decoration, is of later date, about A.D. 1150-1300 (Colton and Hargrave 1937, 97; see Reed 1944d; Beals, Brainerd, and Smith 1945, 11). No sherds of true Tusayan Polychrome were found in the Mancos Canyon work.

Miscellaneous Intrusive Trade Types

The oxidized pottery just discussed and the small amounts of true Chaco Black-on-white and Rosa Gray Ware mentioned in previous sections are considered intrusive in the Mancos, coming from nearby districts of the San Juan drainage, to the west, south, and east, respectively.

Several other types of pottery are also present, sparsely represented, some by only one sherd each. These are of various wares, and come from more distant sources but still within the northern and central Southwest. One is black-on-white, from northeastern Arizona--a sherd from Site 1 of Sosi Black-on-white, a type which is dated at A. D. 1075-1150 (Colton 1946, 253); the others are oxidized--brown ware or black-on-red--and are believed to have been manufactured south of the San Juan drainage in various districts of the Little Colorado area.

The group known as White Mountain Red Ware, at home in east-central Arizona, is represented by several sherds of the well known and widespread type Wingate Black-on-red (Colton 1946, 118-119; Mera 1934, 11; Martin and Willis 1940, Pl. 89-96), and one sherd each of two closely related types or variants.

Querino Polychrome, consisting of bowls with red-on-cream exteriors and black-on-red interiors, is a development of Wingate, whose date is debatable (Colton and Hargrave 1937, 122-123; Mera 1934, 11-12). One sherd was found at Site 18, in probable Mesa Verde association.

Another of the black-on-red sherds from Site 18, not specifically associated with Mesa Verde Black-on-white, is of the broad line style believed to characterize Puerco Black-on-red. The first published formal description of this type (Hawley 1936, 147), quoted and partially followed in the standard corpus of northern Arizona pottery-type description, fails to distinguish it clearly from Wingate, as has been pointed out (Colton and Hargrave 1937, 120-121).

Wingate Black-on-red is characterized by a decoration of hatched and solid elements, well drawn in a good black paint on a heavy bright red slip, the core varying from iron-gray to yellowish-brown and sherd tempered. The yellow paste Wingate often has a pinkish slip, and perhaps constitutes a distinct blond variety. One of the Wingate sherds from Site 18 has brownish paste. The name Puerco has not been affixed to variations of this sort, and the only significance at present seems to be that of simple broad-line and solid-element decoration (for example, Martin and Willis 1940, 141, Pl. 7-A). Originally, Puerco Black-on-red was given as "transitional to St. Johns Polychrome in Pueblo II," but also as occurring in the late thirteenth century (Gladwin 1934, Fig. 4). Presumably the Klagetoh development was intended by this latter statement. Puerco Black-on-red in the sense of broad-line decoration is probably early.

Other types of White Mountain Red Ware have been found in the southwestern Colorado area, including St. Johns Polychrome (a development from Wingate Black-on-red, with bowl exteriors decorated with white) in Mesa Verde association, but only infrequently (Reed 1944c).

Oxidized utility pottery is represented only at Site 1, by sherds of two different wares.

There are several sherds, found in the refuse generally, of a plain brown bowl similar to Winona Brown, of the Flagstaff area in the eleventh century, and less familiar related types of Alameda Brown Ware (Colton and Hargrave 1937, 162-167; Colton 1941, 34-45). The vessel is paddled, undecorated, oxidized, unslipped; smoothed but not highly polished; tempered with an abundance of fine quartz sand; bumpy and of highly irregular thickness; surface color variable, light brown to nearly red, with fireclouds; dark core. This list of traits corresponds fairly closely to the description of Clear Creek Brown, an eleventh-twelfth century subtype or minor type centering in the Verde Valley (Colton 1941, 43). Without direct comparison to type sherds of Clear Creek, I hesitate to make any more definite statement, as it is a type with which I am not familiar. Possibly the vessel is of an undescribed type from a little further east.

One sherd from the vertical middle of the stratigraphic test at Site 1 is of a polished red-brown corrugated bowl, obviously to be grouped generally with McDonald Corrugated, Elden Corrugated, and especially, Showlow Corrugated-smudged and Winona Corrugated, in so-called Mogollon Brown Ware (Colton and Hargrave 1937, 45-66). It differs from all these in that the polished interior is not smudged (black), but yellowish brown. The small corrugations smeared flat by polishing resemble Winona Corrugated and Showlow Corrugated-smudged; the aplastic of fine sand places the specimen with the Showlow series (Mera 1934, 12-13; Colton and Hargrave 1937, 53, 57, 79; and Colton 1941, 30). It may be regarded as a variant or subtype of Showlow Corrugated-smudged (the name Showlow Corrugated is used, perhaps unfortunately, for Showlow Black-on-red with corrugated exterior). I have a similar sherd from Pueblo Bonito in Chaco Canyon.

Worked Sherds and Pottery Objects

Potsherds with their edges ground smooth are fairly common in Pueblo I and Mancos period sites in Mancos Canyon; only a few are of Mesa Verde Ware, and none of Basket Maker III pottery were found. Generally they are slightly irregular in shape: roughly triangular, circular, or between oval and rectangular. Most are of painted pottery, none of corrugated. No perforated worked sherds were found (see Martin 1936, Fig. 14:a, c). The collection of worked sherds from Site 1 includes ten painted (Mancos Black-on-white); two plain gray; seven discs; four more or less triangular pieces (scrapers?), one evidently (broken) between oval and rectangular. See Fig. 52.

The straight tubular pipe of brown pottery, Specimen 3/2, was found in Basket Maker III Slab Structure 30, associated with plain gray Jar 3/6, at a depth of two feet. Its dimensions are: length, 60 mm. (2 5/8 in.); outside diameter of mouth, 26 mm. (1 1/32 in.), inside, 17 mm. (11/16 in.); perforation of bottom, 5 mm. (1/4 in.) in diameter; bowl excavation 14 mm. deep. The residue was well preserved in the bowl, and resembled a cake of Granger Rough Cut; unfortunately, it appears that such dottles are not susceptible to analysis (see Appendix D, report by Volney Jones). See Fig. 57, d.

A solid cylinder of rough gray pottery, Specimen 3/5, was found in the fill over Pit Room 37 at about 2 ft. 6 in. from the surface, and a similar distance above the floor. Its associations could be either Basket Maker III or Mesa Verde, probably the former. The object is 60 mm. (2 3/8 in.) long, 16 mm. (5/8 in.) in diameter. See Fig. 57, c.

CHAPTER VI

BONE IMPLEMENTS

Pointed Bone Tools

Splinter awls (Fig. 53, right): three from Site 1, two from the refuse generally and one, Specimen 1/6, from the top 3 inches; three from Site 4, Specimens 4/1, 2, and 7, from Room Floors E and G; two from Site 7--one near Burial 7/1 in the refuse, a crude one, of a shaft fragment, 52 mm. (2 1/16 in.)long, Specimen 7/2, the other a rib fragment, Specimen 7/11, point missing, 45 mm. long, 12 mm. wide; one from Site 11 refuse, in Pueblo I association, Specimen 11/22.

Awls with epiphysis partly removed (split deer or antelope metapodials): one from Site 1 in old ground level just outside Room C, Specimen 1/13, a short stubby awl 77 mm. (3 in.) long; one from Kiva 4J, found six inches below bench level, Specimen 4/23, an immature bone (ephiphysis incompletely fused), 111 mm. (4 3/8 in.) long (Fig. 53, left of center); Specimen 7/7 (see below); perforated Specimen 11/3 (see below).

Bird bone (turkey tibia) awls, epiphysis (distal)unmodified: one from Site 1, refuse, Specimen 1/10, very small, 50 mm. (2 in.)long, the ephiphysis partly broken off but probably accidentally; a long one (155 mm., 6 6/16 in.) from Site 11 (in a mixed cut, primarily Mesa Verde), with the epiphysis complete, Specimen 11/9; another from Site 11, in primarily Pueblo I association (not a pure cut), Specimen 11/6, the epiphysis mostly worn or broken off (possibly intentionally removed), of a large bird bone resembling turkey but not definitely identified, 93 mm. (3 3/4 in.) long, (Specimen 11/6). See Fig. 53, center.

Rib awls: see Specimen 7/11 under splinter awls, above; Fig. 54, center.

Points and fragments of awls of unknown type: seven from Site 1, one from Kiva 38, one from Kiva 4J (Specimen 4/26).

Large awls: a pair from Kiva 7C, between 2 and 3 feet deep in the fill near the east side. Heavy, strong, and sharply pointed; one 212 mm. (8 3/8 in.) long, of a split deer or antelope metapodial (Specimen 7/7), the other, 180 mm. long (7 1/8 in.), unsplit, with the proximal epiphysis unmodified (Specimen 7/5). See Fig. 53, left.

Bodkins or perforated awls: Specimen 1/16, found in the refuse at a depth of 5 inches, broad and strong, of a shaft fragment without epiphysis, 107 mm. (4 1/4 in.) long, plus tip (broken in excavating, evidently about 3 mm., or 1/8 in. more), perforation near upper end, 4 mm. (3 1/16 in.) in diameter. Specimen 4/29, from the floor of Kiva J, long and thin, flat, no epiphysis; point broken in excavation, between



Fig. 53. Bone awls. Left to right. Specimens 7/7, 7/5, 1/15 and 4/23, 11/9, 1/10 and 11/6, Site 1 (uncatalogued), 4/2, 4/1, 1/12, 4/7, 1/5.

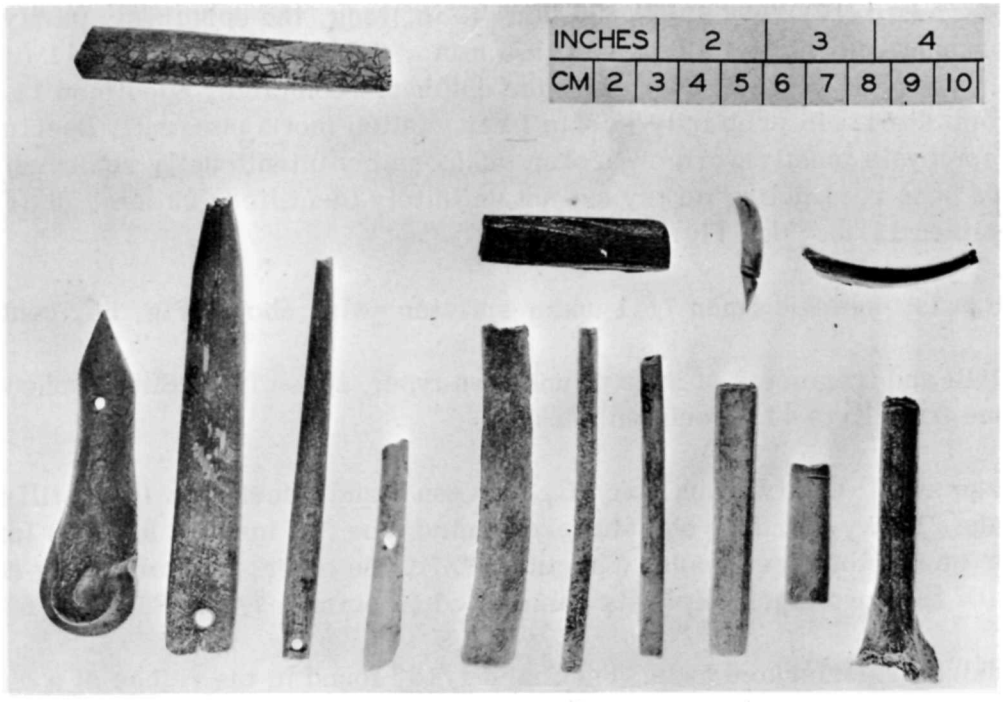


Fig. 54. Bone and shell objects. Upper left, Chisel 7/4; upper center, Rib Awl fragment 7/11; upper right, shell bracelet fragments 11/21 and 1/9. Lower left, perforated bone tools, left to right Specimens 11/3, 1/16, 4/29, 1/11. Lower right, bone tubes, left to right Specimens 3/7, 3/1, 4/9, 1/22, 4/20, 11/11.

105 and 110 mm. long--actual length of incomplete specimen, 93 mm. (3 3/4 in.); neat round small perforation in upper end; maximum width 8 mm., maximum thickness 5 mm.; upper end 6 mm. by 2 mm.; end squared off. Specimen 11/3, from a mixed cut, of a split deer metapodial, 77 mm. (3 in.) long and matching Specimen 1/15 exactly, but with a perforation in the blade only 20 mm. (13/16 in.) from the point. See Fig. 54, lower left.

Chisel

A third unusual and interesting bone object from Kiva 7C is Specimen 7/4 (Fig 54, upper left). This is a finely-made small implement worked allover and beveled to a good edge, highly polished from use. It is 74 mm. long, 7 mm. thick and 14.5 mm. wide at the upper end (2 7/8 in. by 5/16 in. by 5/8 in.) the cutting edge 10.5 mm. (7/16 in.) wide. There are no indications of hafting. It was found near large Awls 7/5 and 7/7.

Bird Bone Tubes

One from Site 1, in the refuse at depth 12 in. to 15 in., Specimen 1/22, 62 mm. (2 1/2 in.) long and 10 mm. (3/8 in.) in maximum diameter. Two from Site 3, found in refuse of the Mesa Verde component; one, Specimen 3/1, 80 mm. by 5 mm., (3 in. by 3/16 in.), the other from a femur, Specimen 3/7, curved and with oval section, 78 to 79 mm. long and 10 mm. in larger inside diameter. Three from Site 4; one broken and burned, one, Specimen 4/9, 70 mm. (2 13/16 in.) long, one only 32 mm. long, and 7 mm. in larger inside diameter (Specimen 4/20). From Site 11 (level association unknown), one broken tube, Specimen 11/3, and the distal epiphysis of a turkey ulna from which a tube had been cut off 67 mm. from the end, Specimen 11/11 (compare Kidder 1932, Fig. 215b; Hodge 1920, 72-74). Fig. 54, lower right.

Possible Musical Instrument

A shaft fragment of a small bone (rabbit?) from Site 1 refuse, Specimen 1/11, with an oval perforation 4 mm. by 2 mm., might possibly be a piece of a flute or flageolet, or whistle (see for example, Gillin 1941, Pl. V:A-1, B-15). Perforated rabbit leg bones from recently excavated Mesa Verde sites are logically identified as tinklers--O'Bryan 1950, 87).

Discussion

The chisel and pair of large awls or so-called daggers (see Hodge 1920, 107, Pl. XX:a) from Kiva C are the most interesting specimens. They could be of the Mancos period, but are more probably to be considered Mesa Verde, as Specimen 7/17, a large McElmo or Mesa Verde Black-on-white sherd, was found on the bench of the kiva, and a few others in the pueblo; so that continued occupancy of Site 7 beyond pure Mancos times in indicated, and specimens found in the kiva fill on or

near the floor should be early Mesa Verde in period, although the pottery of Site 7 is preponderantly Mancos. Similar daggers or large awls were found at Kinishba, Arizona, in some number; in connection with which it was noted that an identical bone implement is used by a Hopi weaver to separate and pick up the warp threads (Hill 1942).

Specimen 7/4 is a genuine chisel or adz, not similar to the cruder instruments, mostly of antler, generally called chisels in the literature (Roberts 1930, 146; Hodge 1920, 110-112, Pl. XXIII-XXIV; Whittemore in Kluckhohn and Reiter 1939, 136), and quite different from the endscrapers. Only one comparison to this specimen has been located (Whittemore in Kluckhohn and Reiter 1939, 137 /Specimen 74/).

Two of the perforated awls, 1/16 and 4/29, can unquestionably be called bodkins or weaving tools. The rather different perforated specimen, 11/3, is unusual, and the function of the perforation toward the point is puzzling (Whittemore in Kluckhohn and Reiter 1939, 133). Perhaps this instrument (and also other, unperforated ones such as 1/15) were originally the size of 7/5 and 7/7, reduced by long continued use.

Splinter awls, awls with split epiphysis (deer metapodial), and bird bone awls with the epiphysis complete apparently occur in all three periods, Pueblo I, Mancos, and Mesa Verde. The bird bone awl from Site 11 could be later than Pueblo I, however (see Morris 1939, 120). Short stubby deer metapodial awls are typical of Basket Maker III (see Morris 1939, 120; Whittemore in Kluckhohn and Reiter 1939, 144), but those from Mancos Canyon sites (one each from Sites 1, 4, 7, and a perforated one from Site 11) are all either Mancos or Mesa Verde, probably the latter. I have no Basket Maker III bone specimens.

Bone tubes seem to be particularly of the Mesa Verde period here, but found also in Mancos association. They are reported in Basket Maker III and Pueblo I, as well as later, in nearby districts (Roberts 1929, 131; Roberts 1930, 147; Martin 1939, 420, Fig. 120:d). These are generally considered to have been mainly ornamental in purpose, especially as they have been found with burials grouped to form wristguards and necklaces (Nordenskiold 1893, Pl. XL:8; Kidder and Guernsey 1919, Pl. 70:f; Hodge 1920, 122, 125-126, 133-134; Kidder 1932, 260; Brand et al. 1937, Pl. XVIII:a; Whittemore in Kluckhohn and Reiter 1939 139; Morris 1919, 42; Morris 1939, 123. Compare Brew 1946, 244).

CHAPTER VII

STONE IMPLEMENTS

Metates and Manos

Site 3

Early component: Three manos from Slab Cist G, one thin and flat, two heavy and of rectangular-oval section.

Site 11

Three fragments of metates, from deep in Pueblo I refuse, above Burial 11/3, all very similar, wide and very thin and shallow troughed. A small and thin wedge-shaped mano (triangular section, theoretically rectangular in outline) from the Pueblo I area to the east of the refuse.

A metate similar to those from Site 11 is illustrated from the Basket Maker III-Pueblo I open sites on the mesa between the Mancos and La Plata rivers (Morris 1919a, Fig. c), and another from contemporaneous sites in the Lowry district (Martin 1939, Fig. 109). Evidently scoop or trough metates (parallel-sided bowl with one end open) are associated with Pueblo I, (Site 11) and Mancos (Sites 1, 7) periods; flat slab metates, probably set in bins, with Mesa Verde (Site 4). This succession is known in adjoining districts and other areas (Bartlett 1933; Morris 1939, 133; Woodbury in Kluckhohn and Rieter, 1939, 63-65).

Site 7

Five scoop metates, rather shallow, open end; one very thick and heavy, an unsymmetrical bowl in a large sandstone boulder, possibly not open at end. Manos: five of triangular section, seven of subrectangular section, one of quite rectangular section, all of average size and normal length-width proportion; one small square mano with rounded corners, transverse section subrectangular.

A mano found in situ in the Pueblo I area, approximately rectangular in outline and section, 7 3/8 in. long, 1 9/16 in. thick, the grinding surface 6 1/2 in. by 4 3/8 in.

Site 1

Fragments of two scoop metates; one oval, flat (curved surface), small (230 mm. by 140 mm. by 80 mm.--9 in. by 3 1/2 in.); two small fragments probably of scoop type.

Manos (mostly incomplete): twenty of oval outline and flattened-oval section, four rectangular in outline and section, fourteen wedge-shaped; one thin and flat, or subrectangular outline, 80 mm. to 100 mm., (3 1/8 in. to 4 in.) wide and 167 mm. (7 3/8 in.) long, only 22 mm. (7/8 in.) thick.

The oval manos include a number of utilized pebbles, generally unworked, aside from the use of one surface for grinding; some of these are not "good" manos, and perhaps should be considered floor-polishers orlap stones or something else. They are 3 in. to 6 in. wide, averaging 1 1/2 in. in maximum thickness. About half the oval manos, however, are of sandstone and show deliberate shaping to some degree and more use. The rectangular manos are large, averaging about 3 in. wide and 1 1/2 in. thick. The wedge-shaped manos (triangular section) are generally 2 in. or 4 1/4 in. wide (extremes, 3 1/2 in. and 3 in.), and 3/8 in. to 1 5/8 in. thick. Complete specimens are 7 in. to 9 1/4 in. long. All manos are of sandstone except the oval pebbles.

Site 4

Three thick and heavy flat slab metates from the floor of Room O, 1 ft. 1 in. to 1 ft. 5 in. long and around 10 in. wide, 2 in. to 4 in. thick, slightly depressed curving surface. A similar but slightly troughed metate from the bottom of Kiva J. A very crude and heavy quite flat metate from just outside the east wall of the pueblo, found on the old ground surface. Three fragments of other thick slab metates, one of them from the kiva. A complete quite small one from the kiva. Two fragments, one from the kiva, of scoop metates.

Manos: nine oval-pebble questionable manos; three rectangular oval; seven rectangular; six wedge-shaped. One of the rectangular manos is shallowly grooved, concave on the longitudinal edges. In addition, three small sandstone boulders, 7 in. by 4 1/2 in. by 2 in. to 11 in. by 7 in. by 3 in., approximately rectangular in outline and flattened-oval in section, with hewn (chipped) edges and flattish grinding surface.

Site 3, late component

From the pueblo, two nondescript fragments of inferior possible manos; from the south recess of Kiva H, half of a large and heavy mano of triangular section.

The only change or trend suggested by the occurrence and relative frequency of mano type is a possible increase in the rectangular mano as against the wedge-shaped (Site 4 vs. Site 1); it has been suggested, however, that wedge-shaped manos are simply rectangular-section manos worn down by long continued use (Kidder 1932, 71; Bartlett 1933, 11-13).

Finally, a nearly worked slab, 11 in. by 4 7/8 in. by 3/4 in., rectangular in outline, with one flat side and one convex side, thus triangular but not wedge-shaped in section (see Morris 1919, 30), was clearly used for grinding but is by no means an ordinary mano. It was found on the bench of Kiva 3H, leaning against the south-east pilaster. The flat side bears traces of red pigment.

Floor-Polishers and Miscellaneous Flat Stones

Thirteen large, heavy pebbles from Site 1 are probably to be classified as floor-polishers (Kidder 1932, 64-65; Morris 1939, 128; Kluckhohn and Reiter 1939, 61 /note by Reiter/; Brew 1946, 242). They are 6 in. to 8 in. long, flattish or thick with one fairly flat side; roundish, kidney-shaped or oval. They do not show signs of use for grinding. There are two similar stones from the Mesa Verde pueblo at Site 3, ten from Site 4, one from Site 7.

Seven smaller flatter pebbles, 1 1/2 in. to 4 1/2 in. in diameter, round or oval, from Site 1, probably were collected and used for some purpose, perhaps also plaster-smoothing.

A large flattish pebble from Site 1, 11 in. by 5 in. by 2 in. shows no signs of grinding but is battered at both of the tapering ends. Its precise function is unknown.

A fragment of a so-called slate tablet (probably fine-grained basalt), Specimen 3/3, from the floor of Room C in the tiny Mesa Verde pueblo, is of unknown purpose. It is a well made tablet 147 mm. (5 3/4 in.) wide at the end, 156 mm. (6 1/8 in.) wide 3 1/2 in. from the end, 7 mm. (5/16 in.) thick. Fig. 58. It resembles a specimen from Kiatuthlanna (Roberts 1931, Pl. 35:a).

An irregular octangonal piece of tabular sandstone 3/8 in. thick, 2 in. to 6 in. on a side, covered the mouth of Corrugated Jar 4/8 in the floor pit in the corner of Room C. No other definite pot lids were found.

A smaller flat piece of sandstone, hexagonal and more regular, Specimen 7/18, is mentioned under ornaments, though its purpose is highly uncertain.

A piece of heavy stone found on the floor of Kiva 4J shows, at one end, about one-third the circumference of a circular hole about 4 in. in diameter.

Axes and Other Grooved or Notched Implements

Made from suitably-shaped river pebbles, mostly of igneous rock, generally made with a minimum of working (Kidder and Guernsey 1919, 125; Morris 1919, 22; Morris 1939, 134-135; Ives 1940, 70-72), Anasazi axes were used for breaking building stone as well as for wood cutting (Kidder 1932, 33; Morris 1939, 157, 158), and are generally poor specimens, far inferior to the finely made three-quarter-grooved or Gila-type axe of Sonora, the Hohokam, and the southern and western (Mogollon) developed puebloan groups. In early periods, the pebble was merely notched on each side for attachment of the wrapped haft; later, fully grooved. The blade was worked down carefully to a good edge in at least some cases; the roughly chipped presumed cutting edges of other specimens may originally have been sharp and polished, and then battered by use.



Fig. 55. Stone axes. Left to right, top: Specimens 4/4, 11/23, 4/22, and bottom: Specimens 4/6, 8/2, 1/17.

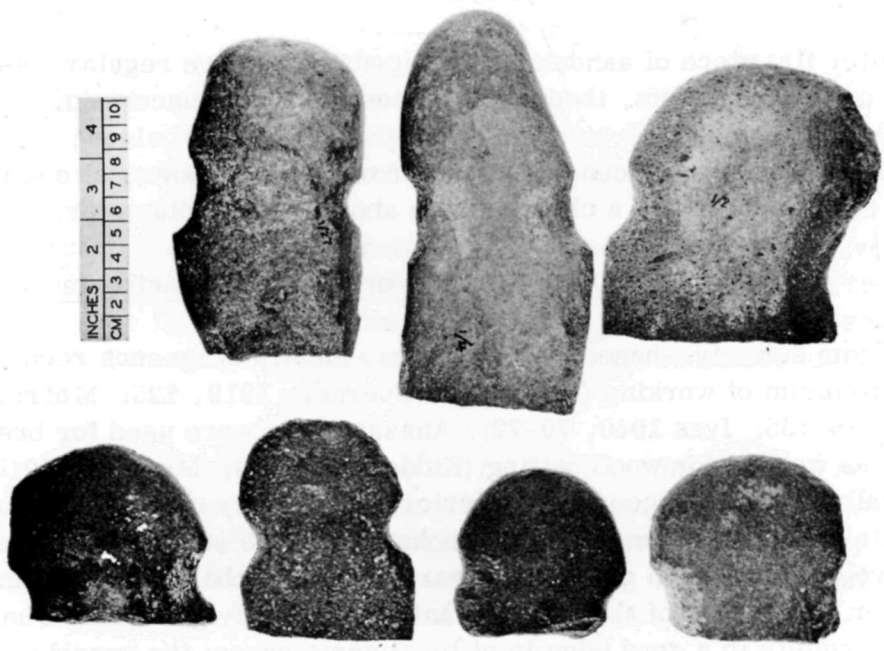


Fig. 56. Polls of notched-pebble axes. Bottom, left to right, 11/28, 4/25, 11/10, 1/14.

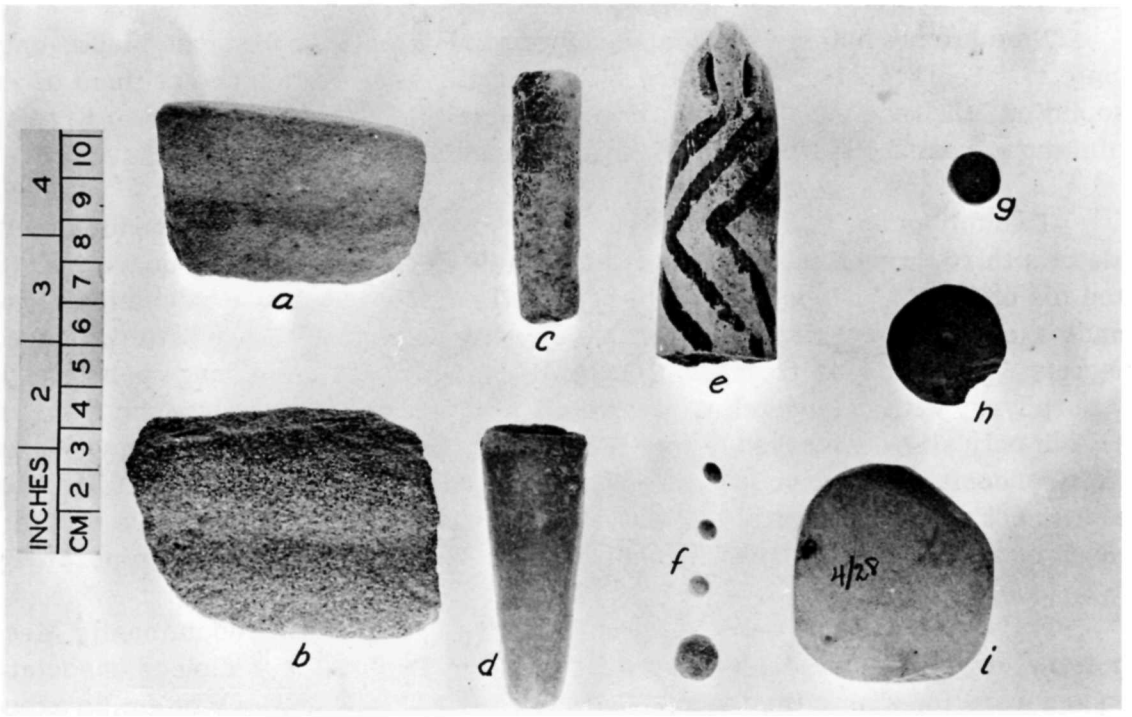


Fig. 57. a, b, arrowshaft tools. c, Pottery Cylinder 3/5. d, Pottery Pipe 3/2. e, black-on-white Ladle Handle 3/13. f, contents of Ladle Handle 3/13. g, h, i, red stone Discs 1/21, 1/1, 4/28.



Fig. 58. a, Slate Tablet 3/3; b, Sandal Last 1/8.

Nine simple notched-pebble axes were found (seven polls, one blade, only one complete). See Fig. 56. Three are from Site 11, very crude, two of them of Pueblo I association, the other unplaceable; five are from Site 1; one was found in Kiva 4J; a miniature from the fill of Kiva 7C is mentioned below.

Two full-grooved axes, with an actual groove ground in all around, and the blade of a third, were found at Site 4. Complete Specimen 4/22, of quartzite, found in the fill of Kiva J, has a deep groove, slightly slanted so that it resembles Rio Grande axes in general shape, but with a roughly chipped or badly battered edge. Complete Specimen 4/4, from the floor of Room A, Site 4, is a large pebble of andesite porphyry, with an encircling groove 45 mm. wide, very shallow and even, with the blade only slightly worked down. Blade 4/6, from the floor of Room G, is well made of andesite porphyry, ground down to a good edge. It looks as if it had been grooved, not merely notched. A finely-made axe blade from the surface of Site 8 is perhaps of a full-grooved specimen, similar to 4/6 and also of andesite porphyry.

Full-grooved axes were found only at Site 4, which is predominantly Mesa Verde in pottery; only notched-pebble axes were found in Pueblo I and Mancos association. (No axes were found in either component at Site 3.) Evidently--as might be expected, and as known in other districts--Pueblo III axes were better made, and more regularly fully grooved, than those of earlier periods. Incomplete notched Axe 1/17, however, has as finely polished a blade as any in the collection.

There are nine other instruments grooved or notched for hafting. Two are discussed in the next section, as they are of special type and material (Specimens 1/29 and 4/5, Fig. 59). Two are so crude as to classify as choppers, and are treated under that head (Specimens 8/1 and 11/4, Fig. 60).

Specimen 1/13 is a knife, shaped like a crude miniature axe, of hard black stone (fine-grained basalt), roughly chipped and notched, 117 mm. by 40 mm. by 13 mm. (4 3/4 in. by 1 5/8 in. by 5/8 in.). Miniature Axe 7/8, also of fine-grained basalt from the fill of Kiva C, is somewhat better made and more nearly the shape of a flat axe. See Fig. 59, bottom. A blade fragment of a similar artifact was also found at Site 7; it is of hard reddish stone.

Specimens 1/7 and 1/28 are flat notched-pebble tools without worked cutting edges, possibly hoes (see Woodbury in Kluckhohn and Reiter 1939, 81). The first is of fine-grained basalt, very crudely chipped and notched, 160 mm. by 74 mm. by 27 mm. (8 3/8 in. by 2 7/8 in. by 1 in.), found in the refuse at a depth of 6 inches. Specimen 1/28 is one side of a flat, naturally split pebble of metamorphic rock, unworked except for the 35 mm. notches, found at about the same level. It is 213 mm. (9 in.) long, 23mm. to 25 mm. (av. 7/8 in.) thick, 110 mm. (4 3/16 in.) in maximum width, immediately below the notches, 90 mm. (3 1/2 in.) wide near the end. See Fig. 60, top. Polls 1/27, 4/25, and 11/28 could possibly be of this type of tool rather than of axes.

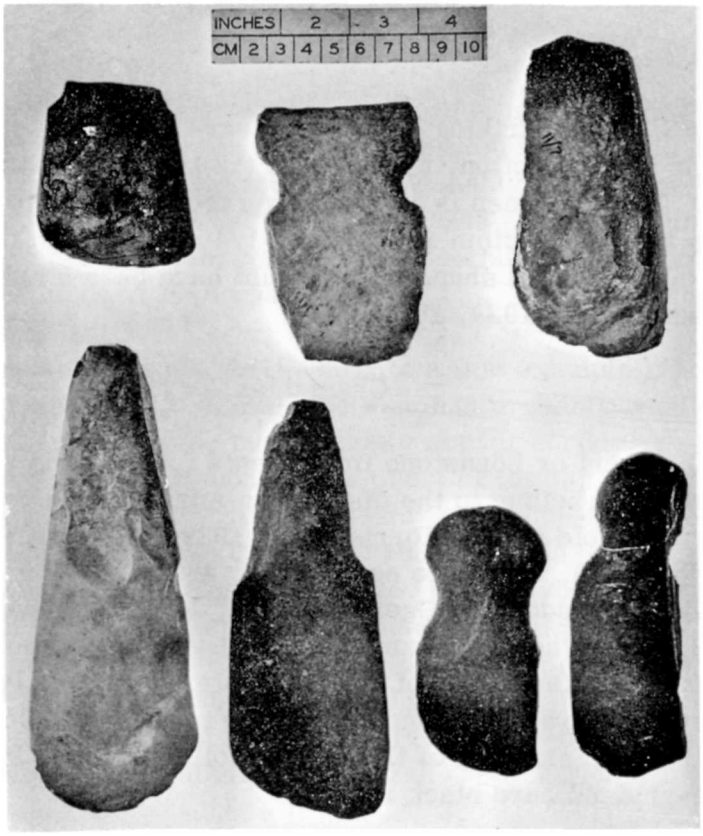


Fig. 59. Chamahia blades and chert and basalt implements.
Top, left to right, 1/29, 4/5, 11/7.
Bottom, left to right, 3/11, 3/10, 7/8, 1/13.

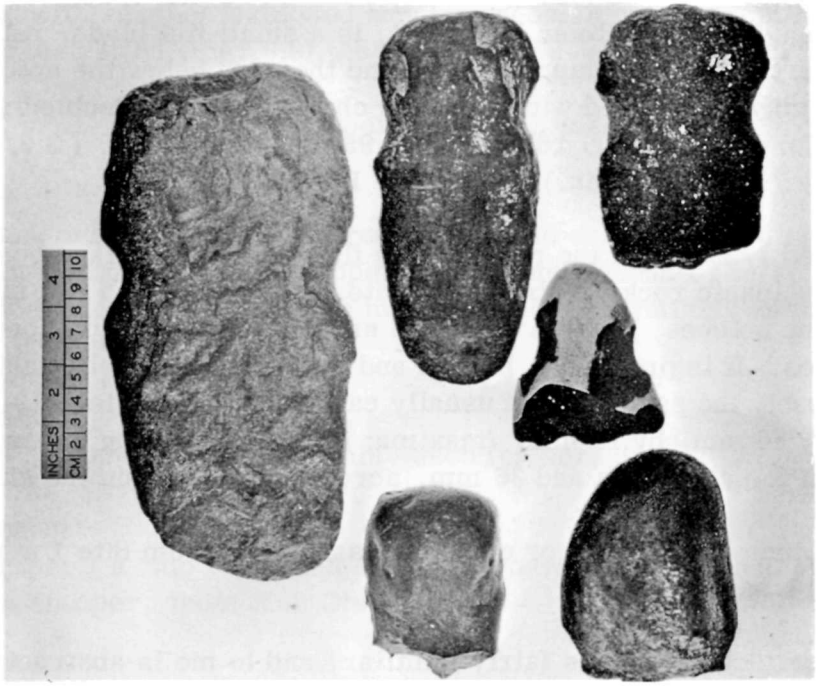


Fig. 60. Stone axes. Left to right, top: Specimens 4/4, 11/23, 4/22; bottom: 4/6, 8/2, 1/17.

Specimen 1/31 is the striking end of a full-grooved maul or hammer, of basalt, triangular in cross-section, the sides of the triangle being 50 mm. to 55 mm. long at the groove. The specimen is 10 mm. long from the end to the opposite side of the groove. See Fig. 60, bottom right. Poll 1/4, included in the count of notched-pebble axes, is of such rounded shape that it could have been a hammer rather than an edged axe (but see Morris 1939, Pl. 158:d).

Chamahias

A pair of fine chert or hornstone implements found in the south recess of the Mesa Verde kiva at Site 3 belong to the distinctive Anasazi type variously called skinning knife (Nordenskiold 1893; Morris 1919, 1939; O'Bryan 1950, 84), chamahia or tchamahia (Fewkes 1909, etc.; see esp. 1917a, 479, and 1919, 67), celt (Holmes 1878, 407, Pl. XLVI:3; Kidder and Guernsey 1919, 125), or scraper (Prudden 1914, 42, Pl. III:2; 1918, 12). These instruments are of varying shape, but constitute a readily distinguishable artifact type, of distinct materials, usually a cherty hornstone, from a particular quarry in banded sandstone close to the Four Corners (visited by J. L. Nusbaum in 1941 and samples of the matrix collected; see Morris 1939, 139), but sometimes fine-grained hard black rock.

The two from Kiva 3J are of the hornstone and fairly typical in shape. One is a simple celt, the other hatchet-shaped with a chipped tang, 135 mm. by 60 mm. by 9 mm. maxima. They were found at either side of the front of the south recess 6 inches above the floor.

Specimen 4/5, from Room M, Site 4, is a small flat blade, relatively wide, of the same chert, notched, chipped all around the edge below the notches. Such typical shapes may be grouped with standard chamahias as undoubtedly similar in function (see Morris 1939, Pl. 169:b). It is 95 mm. by 67 mm. (3 3/4 in. by 2 1/4 in.), only 7 mm. (3/16 in.) thick. See Fig. 59.

Specimen 1/29, from the refuse, is a flat blade of similar appearing material, actually black volcanic rock, probably rhyolite. It resembles a flat miniature axe broken above the notches, but is a complete artifact with a broad short tang formed by shoulder notches. It is probably a broken and reshaped small chamahia, of an alternate material, probably the same as that usually called slate (Morris 1919, 25; 1939, 139). It is 65 mm. by 56 mm. by 15 mm. (maxima; it is 63 mm. long on the shorter side, 47 mm. wide at the shoulders and 36 mm. across the top within the shoulder notches).

A flat piece of quartzite or quartzitic sandstone from Site 7 may be from an implement of the same sort.

The name "chamahia" is fairly familiar, and to me is abstract, not connoting a single use as does "skinning knife;" it is more specific and distinctive than "celt,"

"hoe," or "scraper." Morris discusses the question of uses of these, pointing out various possibilities as hoes, trowels, hide-working tools, etc, and emphasizing the strong possibility that they were used, unquestionably hafted, as agricultural tools (Morris 1919, 26; 1939, 138-139. See also Brew 1946, 241). The location of the two examples found at Site 3 perhaps emphasizes the possiblity of ceremonial significance or use as in the case of modern Hopi chamahias.

Holmes, 70 years ago, says (1878, 407) of a fine example from a Mancos Canyon cliff ruin, which he terms a celt, "This specimen has probably been used for scraping skins or for other similar purposes, but certainly not for striking or cutting, as the material is very brittle. The most conclusive proof of its use is in the appearance of the edge, which shows just such marking as would be produced by rubbing or scraping a tough, sinewy, surface." Morris (1919, 26; 1939, 138-139) finds the use as hoes confirmed by the markings on the edges, produced presumably by sand grains, as well as by the polish of the entire instrument, including concavities. I fail to recognize such striations on my specimens. The evidence discussed by Morris strongly suggests that these implements were hafted and were used primarily as agricultural tools, but use as a fleshing tool seems at least equally likely, and the quality and comparative rarity of the instrument tend to indicate specialized or ceremonial function rather than an ordinary, practical use.

A similar instrument, associated with a pastoral economy, is reported from the Afanas'ev culture of 200-1500 B.C. in the Minusinsk district of Siberia, described in James H. Gaul, "Observations on the Bronze Age in the Yenisei Valley, Siberia," (Dixon Volume /PMP, XX/, 150): "'Paddle'. Flat oblong stone, wide flat blade, naturally polished, with roughly fashioned handle; greenish metamorphic stone. Length 25 cm. ." In the illustration (Fig. 6:9) the resemblance to a "chamahia" is striking.

Scrapers, Choppers, and Hammerstones

Site 1

A large black pebble chipped to a rough edge and evidently used as a chopper; nine smaller roughly-chipped pebble choppers. Two amorphous flake-knives or scrapers; six crude chipped pieces which might have been similarly used. One definite (battered) hammerstone.

Site 3 late component

Three crude chipped pieces, probably used for scraping.

Site 3 early component

A flake scraper (a chip of banded chert with partially retouched edge), and one chipped-pebble chopper, from Slab Cist C.

Site 4

An amorphous piece of black stone perhaps used as a scraper and/or chopper; one hammerstone from the kiva fill.

Site 7

A scraper of whitish chert, slight retouch; a small basalt chopper with one side flat; eight hammerstones (1 1/2 in. to 3 1/2 in. in average diameter, battered basalt pebbles, perhaps in part intentionally chipped to shape).

Site 8 (surface find)

A roughly triangular notched pebble of heavily patinated black chert, with a roughly chipped sharp edge for cutting or chopping and pair of notches, surface otherwise unworked, maxima 79.5 mm. by 66 mm. by 22 mm.. Fig 60, right center.

Site 11

Specimen 11/4, chopper or very crude axe, a partly chipped notched basalt pebble, 114 by 72 by 29 mm.; no association (found on a bulldozed-off dirt pile). Fig 60, right top. Specimen 11/7, a chipped, roughly amygdaloid, flat piece of cherty sandstone, edge worked all around; from a mixed Pueblo I-Mesa Verde cut. Fig. 59, top right. Specimen 11/8, diorite porphyry chopper, an oval piece of pebble, retouched all around; association as 11/7. Specimen 11/16, a chopper from a split basalt pebble, with perfectly flat underside, steeply rounded upper surface with a little work, steeply chipped smaller end; from pure Pueblo I refuse, associated with the pieces of metates. Fig. 60, bottom.

Pot Polishers

Small smooth pebbles, flat, ovoid, or spheroid, with one or more flat sides, were found, especially at Site 1 and 4. They were not faceted and highly polished by use, but probably were used for polishing pottery. If not, they were merely smooth pebbles brought in as curiosities or for unknown functions.

Sandal Forms

The sandstone worked Slab 1/8, from the refuse at Site 1, despite its large size (285 mm. by 133 mm. by 12 mm.; 11 1/4 in. by 5 1/4 in. by 7/16 in.) is shaped exactly like a jog-toes sandal, as are similar specimens designated sandal lasts or forms--some of them as large or larger--illustrated from the Mesa Verde (Nordenskiold 1893, 99, Pl. XXXIX:6; Fewkes 1909, Pl. 21:j; O'Bryan 1950, Pl. XXXII), from Site 41 on the La Plata Valley (Morris 1939, 132, Pl. 144), from Aztec (Morris 1919, 24, Fig. 10), and from elsewhere in the San Juan (Kidder and Guernsey 1919, 105-106; Brand et al. 1937, 95, Pl. XIX:b). Fig. 58, right.

The broken slab tablet, 3/3 described under miscellaneous slabs above, could be of a sandal form; the one from the Mesa Verde illustrated by Nordenskiold is of similar black material.

Sandstone Slab 4/15, found on the floor of Room E, resembles in shape a sandal last, but is small (165 mm. by 76 mm., or 6 1/2 in. by 3 in.), relatively thick, and

crude, not smooth like the specimen from Site 1.

None was found at Site 7 and 11.

Arrowshaft Tools

Catalog number 4/21 covers two small blocks of soft, friable sandstone (one of them arkosic), each with a single shallow groove the length of a larger side, found together on the floor of Room F, Site 4. Fig. 57, top. These are readily identifiable as a pair of arrowshaft-grinders or smoothers, of Toulouse's type IA. Toulouse finds these pairs of single-groove shaped pebbles or blocks, generally sandstone, to be characteristic of Pueblo III in the New Mexico area (Kluckhohn and Reiter 1939, 80-85; see also Kidder 1932, 80-82). Two from the La Plata district apparently do not constitute a pair (Morris 1939, 129), and a single one is reported from Aztec (Morris 1919, 24). Specimens of this type were found in 1947-48 excavations in the Mesa Verde (O'Bryan 1950, 84).

Lithic Materials

(Identifications by Ross A. Maxwell,
National Park Service)

Masonry construction utilized blocks of Mesa Verde sandstone (no samples brought for formal identification by Maxwell).

Metates and manos are of sandstone, except for three manos of conglomerate. One mano is of arkosic sandstone.

Axes and other notched or grooved implements are of various materials, mostly igneous: andesite porphyry (4), basalt porphyry (1), basalt (3), basalt or diorite (2), fine grained basalt (2), quartzite (2), quartzitic sandstone (1). The axes of highest quality are those of andesite porphyry--Specimens 1/17, 4/4, 4/6, and 8/2.

Other specimens are identified with the descriptions; the converse list, of which materials were used for what types of artifacts, is as follows: conglomerate--three manos; friable and/or arkosic sandstone--arrowshaft tools and one mano; sandstone--metates and manos and sandal last; chert--chamahias and choppers; quartzite with chert nodule--chopper; quartzitic sandstone--one axe; quartizite--two axes; ferruginous shale--discs (see below under ornaments); porphyry (mostly andesite)--crude choppers and five axes; basalt (two possibly diorite)--five axes, maul, choppers, hammerstones; fine-grained basalt--tablet ("slate") and three axe-like implements.

Unworked minerals include the following: pieces of selenite were found at Site 1, 4, and 7; in some quantity in the fill of Kiva C, Site 7; and to a less striking degree in Kiva J, Site 4. Pieces of calcite were found at Site 4. Small bits of malachite were found at Sites 1 and 4. Only one piece of obsidian was noted (see Morris 1919, 34), a small chip from the floor of room 7B.

No remains of pigments were found, save for the traces of red on Grinding Slab 3/12,

Concretions and various pebbles were perhaps brought in to the pueblos as fetishes, altar stones, ornaments, or curiosities; some of the pebbles, however, may have been for recognized uses. These include:

Site 1

A small subcylindrical black pebble 3 1/2 in. long, a cylindrical concretion 2 in. by 1 in., four small spheroid pebbles.

Site 3

A concretion from Slab-room C.

Site 4

Two concretions, two spherical pebbles, a small circular pebble.

Site 11

A few nondescript pebbles of igneous rock.

CHAPTER VIII

ORNAMENTS

Disc Beads

Four small beads of white stone and one of turquoise were found near the floor of Room B, Site A. Sifting yielded no additional beads, and none were found elsewhere in the excavations. These are simple circular beads, 3 mm. to 4 mm. in diameter, the perforations 1 mm. to 2 mm. in diameter.

Stone Pendants

Two discs of reddish stone (ferruginous shale; argillite) were found in the Site 1 refuse. One is 28 mm. (1 1/8 in.) in average diameter, irregularly round in shape, and 3 mm. (1/8 in.) thick, with a putative perforation near the edge begun but not completely drilled through. The other is smaller, comparatively thicker, circular, 11 mm. (7/16 in.) in diameter, unperforated. Fig. 57, g, h.

A much larger similar disc of ferruginous shale, 45 mm. by 32 mm. in maximum diameters and 7 mm. in maximum thickness, with a perforation begun (or tiny pit made) on one side, came from the fire vault in room F, Site 4 (Specimen 4/28). Fig. 57, i.

A hexagonal piece of tabular sandstone, averaging 36 mm. on a side, 6 mm. thick, found on the bench of Kiva C. Site 7, is of unknown purpose.

Shell Bracelet Fragments

One piece of a simple Glycimeris bracelet was found in the refuse mound of Site 1. It is 5 mm. (1/4 in.) by 2.5 mm. (1/8 in.) in cross-section. Another smaller fragment of similar shape, from Site 11 in a Pueblo I context, had been reworked into a pendant, one end smoothed down and the other encircled by a little groove. Fig. 54, upper right.

CHAPTER IX

CULTURAL CATEGORIES

Artifacts and unmodified utilized materials will now be presented briefly according to the phase of culture in the ethnographic sense, as against descriptive categories (the convenient subdivision according to material--stone, clay or pottery, bone). In part, this has already been done. Not only have portable stone artifacts been treated separately from masonry structures, as is customary; but also stone beads and pendants have been separated from stone implements, and discussed in a section headed "Ornaments" which also covers shell bracelet fragments. Thus a subjective element appears in the descriptive section, which to be truly "objective" should be subdivided somewhat as follows: A. Inorganic, (1) Stone, (1a) Structures, (1b) Portable artifacts, (1c) Unmodified collected minerals, (2) Clay; and B. Organic, (1) Vegetal, (2) Bone, (2a) Modified bone artifacts, (2b) Unmodified bones--human; other mammals; birds (3) Shell.

The categories which have been presented are, as usual, actually in the nature of a compromise between rigorously descriptive presentation of objects found, and arrangement by presumed-use category. To follow consistently this second approach, that of cultural-anthropological or social-historical analysis, would require a re-organization or material somewhat as follows:

A. Subsistence. Vegetal and animal food remains. Fireplaces as used for cooking, and fire-marked vaults; pottery, as used for preparation and serving of food and storage of water; pot-lids, pot-polishing pebbles and oval or rectangular worked sherds; stone hoes; metates and manos; stone choppers used in connection with with food preparation; hunting weapons (see also D, below).

B. Shelter. Living quarters; that is, non-ceremonial structures. Axes (used for preparing building-stone), floor-polishing stones, stone choppers used in preparation of wooden construction members.

C. Costume and Personal Appearance. Ornaments (stone, shell, and bone tubes); bone tools for weaving, piercing, etc.; sherd discs (if considered a form of spindle whorl although unperforated). Sandal forms, stone hide-scrapers, paint palettes. Artificial cranial deformation.

D. Weapons. Arrowshaft tools (no arrowpoints or fragments of bows or arrowshafts were found); possibly some of the grooved axes and mauls.

E. Religion and Art. Kivas; modes of burial and mortuary offerings, including animal burials (none found, except turkey bones in kiva pits). Pipes, musical instruments. Decoration of pottery.

F. Unclassified Artifacts. Those of unknown function.

The artifactual material already presented by descriptive categories and in addition the unworked utilized material, is now ordered according to this scheme.

A. Subsistence.

Animal bones were found in some quantity in the refuse mound of Sites 1, 7, and 11, occasionally in structures. Several food bones, including turkey bones, were found in slab-lined Vault A at Site 1. Turkey bones were numerous in the fill of Kiva 7C, not in others, and were found in the Basket Maker III pit room at Site 3. Dog jaws were found only in Pueblo I refuse at Site 11. No animal burials were found. All animal bones were sent to the National Museum for identification (see Appendix E). Corncobs are reported on by Volney Jones in Appendix D. Not being conversant with the subject of corncobs in general, I am unable to draw any significant inferences from his findings. The elliptical corncob with 14-kernel rows, possibly a small-kerneled flint corn, is of Basket Maker III association; the Mancos period yields small cobs of three varieties.

The chert implements called chamahias were perhaps utilitarian agricultural tools --hafted as hoes--rather than ceremonial objects. Corn was ground on metates; in bins indoors, or otherwise firmly set; with handstones (manos).

Corn was undoubtedly supplemented by other plant foods, cultivated and wild. Meat evidently included deer, mountain sheep, rabbits, rodents, and wild turkey; although certain of these animals might have been sought for their hides alone, and any of the rodent bones may be self-intrusive. Animals were no doubt hunted with bow and arrow, as a pair of arrowshaft tools were found. Other methods possibly used, (for instance, snaring), are not known.

That the turkey was used for food, not for feathers alone, is indicated by the finding of turkey bones in a slab-lined vault, at Site 1, which shows traces of burning, and is regarded as probably a cooking-pit. Turkey bones occurred in some quantity in all horizons from Basket Maker III to Mesa Verde; the only other bird represented is the raven (a single bone).

Cooking of food is indicated by the sooting of corrugated pottery jars; firepits in rooms (see under "Shelter") might have been used for cooking as well as warmth, and the outdoor firepit at Site 4 may have been for cooking and/or pottery-baking. Gray so-called utility or culinary jars were used for cooking and probably for the storage of food. Painted pottery bowls were presumably used for eating, as "table" ware; and painted ollas for water and perhaps also for storage of food. Thin stone slabs were used as jar-covers. Pottery was manufactured from clay, constructed by coiling and thinned by scraping (probably with worked sherds except in the earliest period); and finished either by polishing with a small pebble and painting, or by finger compression of unobliterated exterior coils.

Baskets, whose manufacture is presumed, involving bone awls found, were undoubtedly used in collecting, preparing, and consuming plant food. Food also was undoubtedly stored in the round slab-lined pits of an early period at Site 3, and in certain rooms of later pueblos.

B. Shelter.

The structures described in Chapter III are, except the so-called kivas, living and/or storage rooms. An incomplete semi-subterranean earth lodge or pit house is of an early period; later dwellings are above ground of masonry, compact groups of rather small rooms. Stone axes and mauls were undoubtedly used to quarry and prepare stone and to chop wood for construction. Beams and smaller vegetal construction materials were probably prepared with stone choppers and scrapers. Adobe floors were evidently prepared by smoothing with large flattish pebbles, and wall plaster was no doubt finished with smaller stones.

C. Costume and Personal Appearance.

Use of skins is indicated by small stone scrapers, possibly used on hides, and by bone perforators; woven (cotton) cloth is suggested by other bone implements referred to as weaving tools. Unperforated sherd discs may possibly have been used as spindle whorls in this connection. Stone and shell ornaments and bone tubes have been described, and artificial cranial deformation has been discussed. Red pigment on Grinding Slab 3/12 is connected either with personal adornment or with some ceremonial procedure.

D. Weapons.

Bow and arrows (a pair of arrowshaft tools provide the only intra-project evidence) and stone axes and mauls may have been made or used for warfare, as well as for hunting and house construction respectively.

E. Religion and Art.

In addition to kivas and burial methods, we may consider the pottery pipe, the alleged flageolet, and at least some of the objects of unknown function (for instance, concretions and spherical pebbles), or of possible utilitarian function (for instance, large bone awls or daggers, and possibly chamahias), as probably ceremonial.

Painting and corrugation of pottery (occasionally combined) are the only forms of artistic expression known, beyond the undoubted esthetic (or at least emotional) satisfaction of producing a well-made bone or stone tool. I have made no attempt to study the style of design of the painted pottery, having so few complete vessels. Several very thorough such studies have been produced by Brew, Morris, and others.

In a report written primarily from the ethnographic approach, artifacts would be actually described and discussed according to this scheme, instead of merely a resumé appended after extended treatment under convenient descriptive categories; and with a recapitulation which would be hardly more than a list of artifact types strictly according to materials used. That is, pottery vessels and pottery manufacture

would be treated along with corncobs and metate types; pottery decoration perhaps separately under art; stone axes in connection with house plans and construction materials; and the majority of bone implements and spindle whorls, sandal forms, stone beads and pendants, shell bracelets, bone tubes, and artificial cranial deformation presented in a single section relating to dress and ornament.

The uncertainty as to the function of so many items recovered, and the disappearance of so many classes of material, force the archeologist either to describe his collections and observations according to materials used (or an arbitrary variation of that arrangement), or else to make a great many assumptions beyond the covert ones he cannot escape. An ethnographer knows that in the group he is studying bone awls are used in basket making--he sees it done. An archeologist assumes or guesses that the bone awls he finds were probably used in basket making, which he may do, even if he finds no remains of baskets at all, only on the basis of ethnographic information from other tribes, and seldom even from descendants of the group whose cultural remains he is studying.

CHAPTER X

CONCLUSIONS ON SEQUENTIAL DEVELOPMENT

Several distributional and theoretical discussions have been incorporated at what seemed the appropriate places in the sections describing the various categories of material found. These include such topics as the absence of sites on the Mancos shale; towers and sites of peculiar ground plan; burial methods; cranial deformation and its implications; taxonomic classification of pottery; the relation of Mancos Black-on-white to Chaco 2 and 3, the use of the term Chacoan; the wide spread of Mesa Verde Black-on-white; the problem of so-called McElmo Black-on-white; the Pueblo I occurrence of Rosa Gray Ware; general gray ware development; San Juan Orange Ware, especially the relation between the materials called Bluff Black-on-red and Deadmans Black-on-red; bone implements; metates and manos; axes; chamahias, minor comparative notes.

This section, consequently, will be devoted to certain general topics: chronology and period terminology; distribution of sites, related physiographic considerations, and the abandonment of the area.

In the discussion of stratigraphy at each site in Chapter II, "synopses," evidence as to period of occupation is presented, leading to the following inferences:

The early occupation at Site 3 is pure Basket Maker III.

Sites 1 and 7 were occupied during the Mancos period, phase, or focus (which may be called Pueblo II, Pueblo IIIA, or Early Classic), into the beginning of the Mesa Verde period with appearance of the McElmo style of carbon paint black-on-white.

Intrusive pottery at Site 1 included a few sherds, found on and near the surface, of three trade types known to have been produced in their areas of manufacture between A. D. 1100 and 1150, indicating appearance of the McElmo style during twelfth century occupation of the site. Tree-ring dates obtained by E. T. Hall, Jr. in 1942, and checked by T. L. Smiley in 1950, more or less substantiate this, falling later in the century than I had anticipated and within the dates set by Gladwin for his so-called McElmo phase (Gladwin 1942, 2). The final phase of occupation of Site 1 must have extended at least to A. D. 1195 and probably to after 1200.

Intrusive trade pottery types of somewhat earlier date--Pueblo I orange ware antedating A. D. 900, Wingate Black-on-red of the general period 900 to 1100 and Tusayan Black-on-red, which is dated at A. D. 1050 to 1150--are comparatively common at Site 1. The occurrence of sherds of Basket Maker III and Pueblo I types probably represents retention of old pieces by the first Mancos settlers on the low rise, rather than a sparse early occuptation with underlying architectural remains which were not located, since the early material was not found to form a separate component in the

refuse mound. A Pueblo I site adjoined Site 7, however, and some Pueblo I material was found in the Site 7 refuse.

Site 4 follows after Sites 1 and 7 very closely, with perhaps considerable overlapping in time. Both types of black-on-white, Mancos and Mesa Verde, are well represented; Mesa Verde Black-on-white and standardized corrugated preponderate. There is some suggestion that the east and north rooms, KLMNPQ, were disused earlier than the rest of the building; they yielded more Mancos Black-on-white than Mesa Verde, more variable corrugated than standardized. The amounts concerned are insufficient to base definite conclusions on. In the kiva, Mesa Verde considerably exceeds Mancos Black-on-white in the lower levels; Mancos exceeds Mesa Verde in the proportion 3:4 in the overburden. Standardized corrugated preponderates throughout the kiva fill. Intrusives at Site 4 are very few, and of a period antedating the main occupation.

The late component at Site 3 is typologically later than Site 4, virtually pure classical Mesa Verde.

Site 11 was occupied--perhaps repeatedly rather than continuously--throughout the entire sequence, from Basket Maker III (the bottom cut in the west end of the refuse) through Pueblo I (pure cuts, burials) and Mancos (found only mixed with Pueblo I and Mesa Verde) into Mesa Verde (nearly pure in top levels). Occupation was evidently heaviest during Pueblo I, sparse in Mancos times.

Table 1 summarizes the features of material culture found at these sites, placed, so far as possible, in the successive periods (for much fuller listing of focus determinants, see Brew 1946, 93-96). Items marked with an asterisk were found only in circumstances which indicate the association given, but do not preclude placement in the Mancos period. In this tabulation I am preferring "focus" as the term for the basic unit of classification (Colton 1939), since the term "phase" is quite differently used outside the Southwest. I have failed, however, to use "focus" in the text of the report consistently.

The problematical McElmo-style horizon is indicated parenthetically; its reality as a separate phase or focus is somewhat questionable (but see the note above on the categories "Mancos" and "McElmo"). The use of "Montezuma phase" for the latest focus of the upper San Juan (Gladwin 1934) seems an unnecessary addition to terminology, with the meaningful name "Mesa Verde" at hand. I have selected for the local Pueblo I development a focus-name corresponding to those for the preceding and succeeding foci; that is, the same geographic name as that of the painted pottery type diagnostic of the period. (In his mongraph published in 1950, O'Bryan describes for local Basket Maker III a "Four Corners phase," little different from the previously established La Plata focus, and for Pueblo I defines a "Chapin Mesa phase" corresponding to the Piedra focus as presented herein and in my 1944 summary of this work.)

PERIOD	POTTERY	HOUSE TYPE	OTHER MATERIAL CULTURE	BURIALS	SITES
1. La Plata focus (Basket Maker III, Modified B. M., La Plata phase.) Prob. about A. D. 450-750	Plain gray affinis Lino; iron paint b/g (La Plata B/w); often with fugitive red exteriors. Abajo R/o.	Pit house with ante-chamber, circular slab-lined storage cists.	Tubular brown pottery pipe ("cloud-blower"). Manos of flat-oval section. Chipped crude chert scrapers and pebble choppers. (Bone tools not found in 1942 work.) Elliptical c.s. corncob, 14 rows of very small kernels, possibly a variety of flint corn.	Underformed dolichocephal, semiflexed on side, in floor pit in cist, no offerings.	Components at 3 and 11 and at a few survey sites. Also Johnson-La Plata district, Mesa Verde pit houses A, B, C; Shabikeshchin, etc.
2. Piedra focus (new term) (Pueblo I, Developmental Pueblo.) Prob. about A.D. 750-900.	Banded-neck and plain gray, Piedra B/w. Intrusive: Alkali series (Abajo R/o, La Plata B/o, Bluff B/r) and Rosa G Ware.	(Presumably crescentic rows of contiguous surface rooms and associated "kivas" or pit houses.)	Worked sherds. Flat thin scoop metates, manos of flat-oval and triangular section. Rough stone choppers. Crude notched-pebble axes. Bone awls. Reworked fragment of shell bracelet.	Lambdoid deformation, brachycephaly. Semi-flexed on back in refuse: two adults. Extended on back in caliche below refuse: an infant. Pottery offerings (esp. Rosa G Ware, also Chaco l-Piedra).	Major component at site 11. Adjacent component at site 7. Sherd areas 22, 23, 24. Also Johnson-La Plata, Piedra, and Ackmen-Lowry districts.
3. Mancos focus (PuebloII or Pueblo III A-Chaco; Early Classic or Great; Mancos Mesa phase.) Prob. about A. D. 900-1150.	Variable corrugated; corrugated necks, banded-necks, and plain gray in small amounts; Mancos B/w. Intrusive: Wingate B/r, Pueblo I types of San Juan O Ware as above plus Tusayan B/r, Citadel Poly; Sosi B/w, Chaco 3 B/w. Last three perhaps belong in McElmo focus.	Small unit-type masonry pueblos with Mesa Verde-type kiva in plaza (six pilasters, large south recess). Intramural kiva at site 7. Components at large pueblos.	Worked sherds. Scoop metates, manos of rectangular, oval, triangular section. Floor-polishing and pot-polishing pebbles. Notched-pebble axes, small flat chamahia blades, sandal last, crudely-flaked scrapers and choppers. Bone awls, bodkins, tubes. Fragment of shell bracelet. Red shale discs (pendants). Small corncobs of three varieties.	Lambdoid deformation, brachycephaly. Semi-flexed on back or side in refuse; children in twisted and distorted positions, more or less face down. Pottery offerings; in general --whole vessels, or, with children in site 7 refuse, only very large sherds.	Site 1, major component at site 7, secondary component at site 4. Survey sites 2, 16, 17, 21, 27 and components at 15, 18, 19, 20, 26. Also "Chaco" component at Aztec and in La Plata sites, earlier component likewise at Lowry and Wilson pueblos.
McElmo focus? (dates given for McElmo phase by Gladwin 1943, 1180-1230.)	McElmo B/w. (Citadel Poly, and Sosi B/w, and Chaco 3, all of period 1100-1150?)	(No separate sites.)	?		(Components at sites 1 and 7.)
4. Mesa Verde focus (Pueblo III or III B-Mesa Verde; Late Classic; Mesa Verde and McElmo phases.) A.D. 1150-1300.	Standardized indented-corrugated; Mesa Verde B/w. No intrusives (Wingate B/r and St. Johns Poly. in adjacent districts in Mesa Verde sites).	Small unit-type with plaza kiva; double-unit with two kivas; twin-kiva sites with pueblo small or lacking; large pueblos with intramural kivas and adjoining large kivas. Isolated towers.	Thick, heavy, flat slab metates. Manos as above. Scrapers. Chamahias. Crude notched* and superior full-grooved axes. Pair of arrowshaft-smoothers of soft sandstone. Turquoise and white stone disc beads. Bone tubes, chisel*, awls, "daggers,"* bodkins.* *Found only in circumstances of possible Mancos period association.	(Intramural infant burials without offerings, site 7, could well be of the McElmo-Mesa Verde period.)	Components at sites 3, 4, 11, and 15, 18, 19, 20, 26; pure or preponderant at survey sites 5, 6, 9, 12, 14, 25, 28, 29, 30. Also late component at Aztec, Lowry, Wilson, Chaco Canyon; cliff dwellings of Mesa Verde and Canyon de Chelly; Hovenweep towers, etc; Yucca House; etc.

TABLE I

The periods are defined by pottery and architecture, primarily pottery (see Roberts 1936, 515; 1937, 13), and objects of other categories assigned according to their association with pottery types and types of structures. General cultural stage or level can be based on architecture; chronological succession may best be determined by pottery. These two approaches are not irreconcilable. When conflict arises, as when pottery of one established period is found with a structure typical of another, which may yield no tree-ring dates, the worker with primarily a historical approach must give the pottery greater weight because of its specific chronological significance.

The allocation to periods of pottery types and of structures, and hence of other material, has been essentially typological throughout this report, based on the close comparisons to materials of known date, or at least known sequence, in other districts.

Certain stipulations are implicit in this. They are generally accepted and rather obvious, perhaps, but cannot properly be called axioms. The first is, that closely similar finds in adjacent areas are related and roughly contemporaneous. That is, pottery found in Mancos Canyon, locally made or intrusive, may--so far as it is correctly identified--be accepted as belonging to the type to which it is assigned, and falling within the period to which the type is dated elsewhere (so far as that dating is trustworthy). People lived in masonry pueblos with standardized kivas contemporaneously on the Mesa Verde, in Mancos Canyon into which the former drains, and across the divide in the La Plata Valley. See Table 2.

The second assumption is, that although cultural development is a continuous process, definite stages can be segregated and are, in fact, characteristic. That is, reasonably stable and comparatively uniform cultural configurations are not merely brief climaxes, or arbitrarily selected points on a continually changing line, but persist sufficiently long without important change to overshadow the transitions, and are the internodes rather than the nodes. The transitional stages might well be considered the most significant, the most important to study; but the larger periods have to be outlined and well understood before the transitions can be isolated and defined. Establishment of chronology is a necessary antecedent to study of process. Both these assumptions seem to fit the facts, so far as the Southwest is concerned.

The development from primitive semisubterranean structures to large pueblos with standardized semisubterranean structures, and from crude pottery to good pottery, is logical a priori; and the several periods are, of course, well known and their succession perfectly familiar and adequately demonstrated. The evidence of the Mancos Canyon sites themselves as to relative dating is nearly complete, however, despite the scarcity of stratigraphy:

1. Mesa Verde is later than Basket Maker III; indicated at Site 3 where Kiva H of the little pueblo with Mesa Verde Black-on-white is clearly dug into the pre-existing Pit Room F with plain gray pottery.

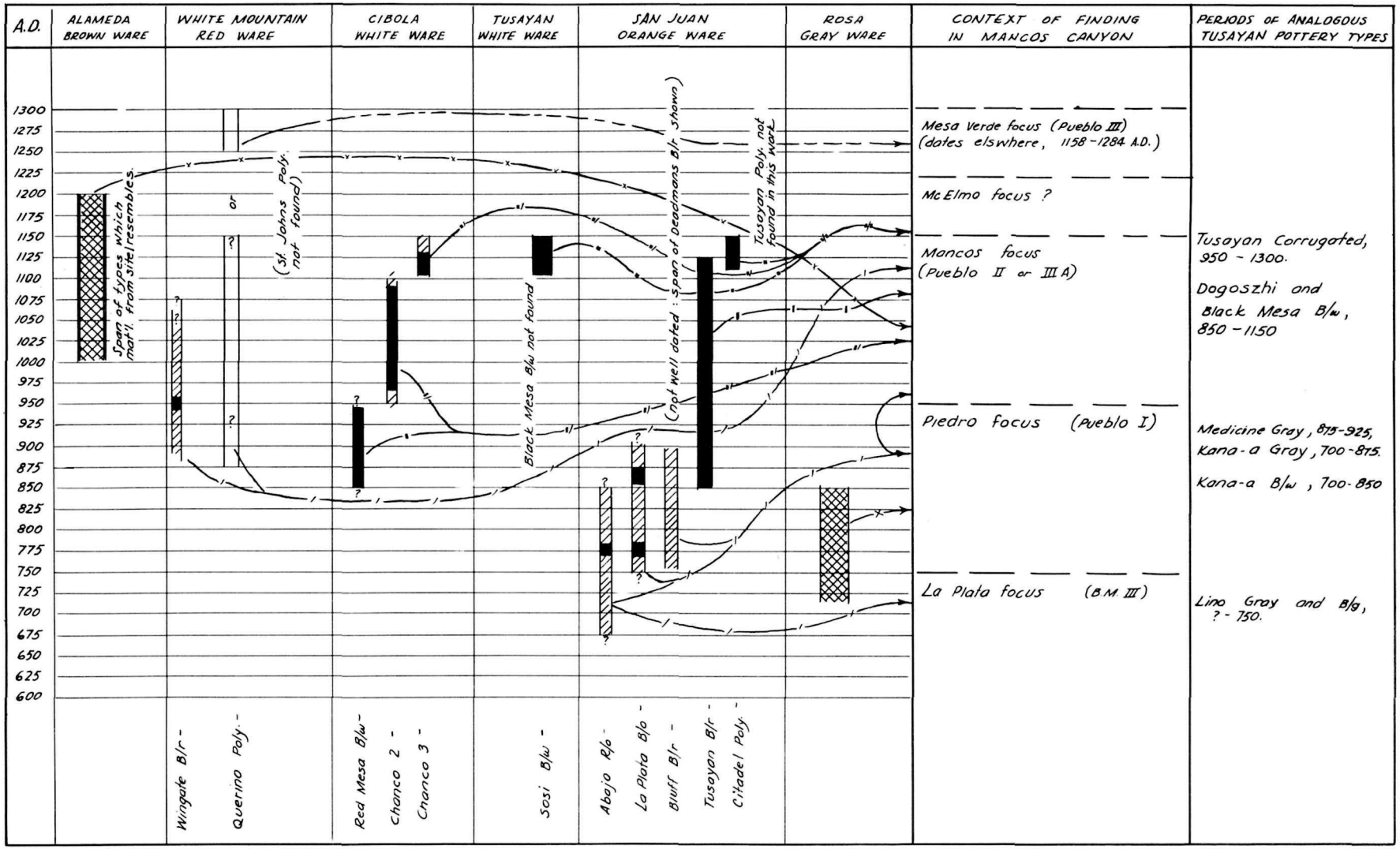


Table 2. The evidence of intrusive pottery types. Solid black shows well dated types or specific applicable tree-ring dates. Hatch-filled shows presumed span of time. Cross-hatched shows ware well dated as a group.

2. Mesa Verde and Mancos are later than Pueblo I; demonstrated at Site 11 where mixed Mesa Verde, Mancos, and Pueblo I pottery overlies pure Pueblo I levels.

3. Mesa Verde is later than Mancos; suggested by the occurrence of virtually pure Mesa Verde sites, mixed sites, and Mancos sites containing Pueblo I sherds; Mesa Verde pottery in the pueblo and not the refuse at Site 7, and in much higher proportion in the pueblo than in the refuse at Site 1; red ware types in Pueblo I and Mancos contexts, not in Mesa Verde; stratigraphic indications at Sites 1 and 11.

4. Pueblo I is later than Basket Maker III: indicated by Basket Maker III sherds in Pueblo I collections and occasionally in Mancos and Mesa Verde collections; no Pueblo I sherds in the early component at Site 3 or survey Site 23; by occurrence of red-on-orange in Basket Maker III, Pueblo I, and Mancos; of black-on-orange only in Pueblo I and Mancos; confirmed by one instance of stratigraphic separation.

The dates given for the four periods are based on evidence in neighboring districts, and correspond in general to the figures usually assigned these periods.

The inception of Pueblo I is given as A.D. 750, rather than 700 as is often stated, as there are few if any definite and dependable Pueblo I dates earlier than that (see Gladwin 1942 /somewhat exaggerated/); all except a few "plus x" dates fall between A.D. 770 and 860. As a matter of fact, sites with certain Pueblo I features dating at circa A.D. 775 and at 855-870 have even been called Modified Basket Maker (Martin 1939). These sites show contiguous house-rows and beginning of masonry; banded-neck gray as well as a great deal of plain gray; La Plata Black-on-orange as well as Abajo Red-on-orange; stone axes.

The definition of Pueblo I by distinctive features or new traits appearing may be summarized as: slipped black-on-white (Kana-a or Kiatuthlana-Chaco I-Piedra) and banded-neck gray, La Plata Black-on-orange and related forms ("Pueblo I Black-on-red"); contiguous-jacal surface houses, and pit dwellings or kivas, with a little use of masonry; cotton; cranial deformation. Sites showing all or most of these traits, as well as any amount of plain gray pottery and/or undeformed long skulls and other early traits, surely must be called Pueblo I, even if largely of Basket Maker cultural tradition, especially if they yield dates in the sixth or ninth centuries. Confusing transitional sites are, of course, to be expected.

The period called Pueblo II was originally defined by small masonry pueblos as against large ones; but small and large pueblos apparently occur together throughout the several centuries of the developed Anasazi culture, and the term is now used most often to signify the phase of culture which has been found to fall in the period of,

in round numbers, A. D. 900 to 1100 (papers by Colton, by McGregor; Haury and Flora 1937). In the eastern San Juan, however, this period is sometimes called "Pueblo III-A" (Roberts 1929-1932), or "Early or Chaco Pueblo III" (Morris 1939), this is because the tree-ring dates obtained from the great ruins of Chaco Canyon all between A. D. 845 and 1131 and have often--no doubt erroneously--been taken to indicate that span of time for the construction and occupation of these great pueblos in their final form.

Consequently, so-called Pueblo II in this area has been a hypothetical or typological brief transition (Morris 1939), or a postulated period of nothing but unit-type pueblos (for example, Roberts 1935, 518). In the western Anasazi range, Pueblo II has been defined by a single pottery type, Black Mesa Black-on-white, made from A. D. 850, or thereabouts, to perhaps as late as A. D. 1130. This is a more usable criterion.

Pueblo II is a convenient term for the period of Black Mesa-Chaco-Mancos Black-on-white; of the rise of the large open pueblos of Aztec, Lowry, and Chaco Canyon, and of the circular masonry pit houses between Black Mesa and the Colorado River. I see no great gain in saying "Developmental" for Pueblo I and western Pueblo II, "Classic" for the eastern period contemporary with western Pueblo II and for Pueblo III. This is a retrogression from precise historical approach back toward the general and simplified Cummings classification of Pit House and Pueblo periods, which may be the best for elementary teaching, but which cannot be used successfully by archeologists. In any case, I am generally using "Pueblo II" throughout this paper to correspond with Morris' and Roberts' "Pueblo III-A, Chaco."

The dating of the Mesa Verde period (Pueblo III or IIIB), including the McElmo phase, at A. D. 1150 to 1300 (Morris 1939, 2-3) requires no discussion. However, one must add that the tree-ring dates of circa A. D. 1195 from Site 1 are presumably to be correlated with the so-called McElmo component there, and suggest very definitely that true classic Mesa Verde Black-on-white (for example, at Sites 3 and 4 here) was not produced until after 1200.

Much of the exposition and digression in this section is presented largely because of stimulation by Kluckhohn's recent critique of period classification (Kluckhohn and Reiter 1939, 151-162), and consequent desire to be rigorously logical--within reason--and to bring covert assumptions out into the open. The specific problem of small sites in Chaco Canyon which gives rise to Kluckhon's difficulties probably can be fairly easily resolved, but the discussion of the general subject is very important. Kluckhohn's main point, a highly justifiable complaint, is that the divisions in the Pecos classification are variously defined and used by different archeologists--and sometimes by the same archeologist--on the basis of pottery alone, of architecture, of pottery and architecture together, of so-called total culture complex, or of absolute time alone.

Although interpretation of human history in terms of general principles may be the ultimate objective, the first objective--before an attempt to seek out generalizations can be made--is the outlining of the history of material culture; and the first step in that is the establishment of chronology. My personal, pragmatic inclination is to give up trying to abide by so-called total culture-complex, or even by architecture as well as pottery, and avoid academic argument over terminology and assignment of sites, by making the system overtly chronological: for example, Pueblo II is the span of time during which Black Mesa Black-on-white was made (about A. D. 860-1100 or 1130), or during which Chaco 2 and Mancos Black-on-white were made (perhaps A. D. 930 to 1150?); or perhaps the period A. D. 900 to 1150, whatever was happening.

That small-house or unit-type ruins were occupied contemporaneously with large pueblos, often close to them, during this period, and during the succeeding period in which the great cliff dwellings of the Mesa Verde and northeastern Arizona were built, does not seem incomprehensible or even perturbing. Today the Zunis live in a large pueblo and also partly in little scattered hamlets (Pescado, Nutria, Tekyapoa, Ojo Caliente); families or individuals often have permanent houses both in Zuni and at an outlying village. Furthermore, there are, at Zuni, families living in houses close to, but distinctly separate from, the main village. The small-house ruins may be in part farmhouses of Anasazi families who spent the winters in larger centers and the growing seasons near their fields (see Dutton 1938, 79), and in large part simply permanent homes of families who did not move to the big towns.

In lower Mancos Canyon four of the excavated sites and thirteen of the survey sites are unit-type pueblos, typical or resembling generally the type. Nine of these yield Mancos Black-on-white and little or no Mesa Verde; five are pure sites of the Mesa Verde focus; and three combine components of each period, as do both of the large pueblos on the canyon floor.

The canyon floor consists of a flat inner, lower terrace, relatively heavily vegetated, in which the Mancos River is running at present, cutting a comparatively shallow channel; and a second terrace between it and the cliffs and talus slopes. The second terrace is an irregular, rolling surface with very sparse vegetation, ending in an approximately vertical bank, ranging from 5 to nearly 20 feet high, resembling the side of an arroyo.

All prehistoric sites found in lower Mancos Canyon are on the second terrace; and three of them (8, 17, 24) are on the edge of the terrace and slightly to mostly eroded away. No evidence of Anasazi occupation of the first terrace is observable, although there are indications of old as well as contemporary Ute camps or houses.

The reason for this is undoubtedly that the second (upper) terrace represents the canyon floor as of Anasazi times, corresponding to the Tsegi formation of northeastern Arizona (Hack 1942). This old valley floor was evidently partially removed by arroyo cutting, at or after the end of the Mesa Verde period; and its remnants

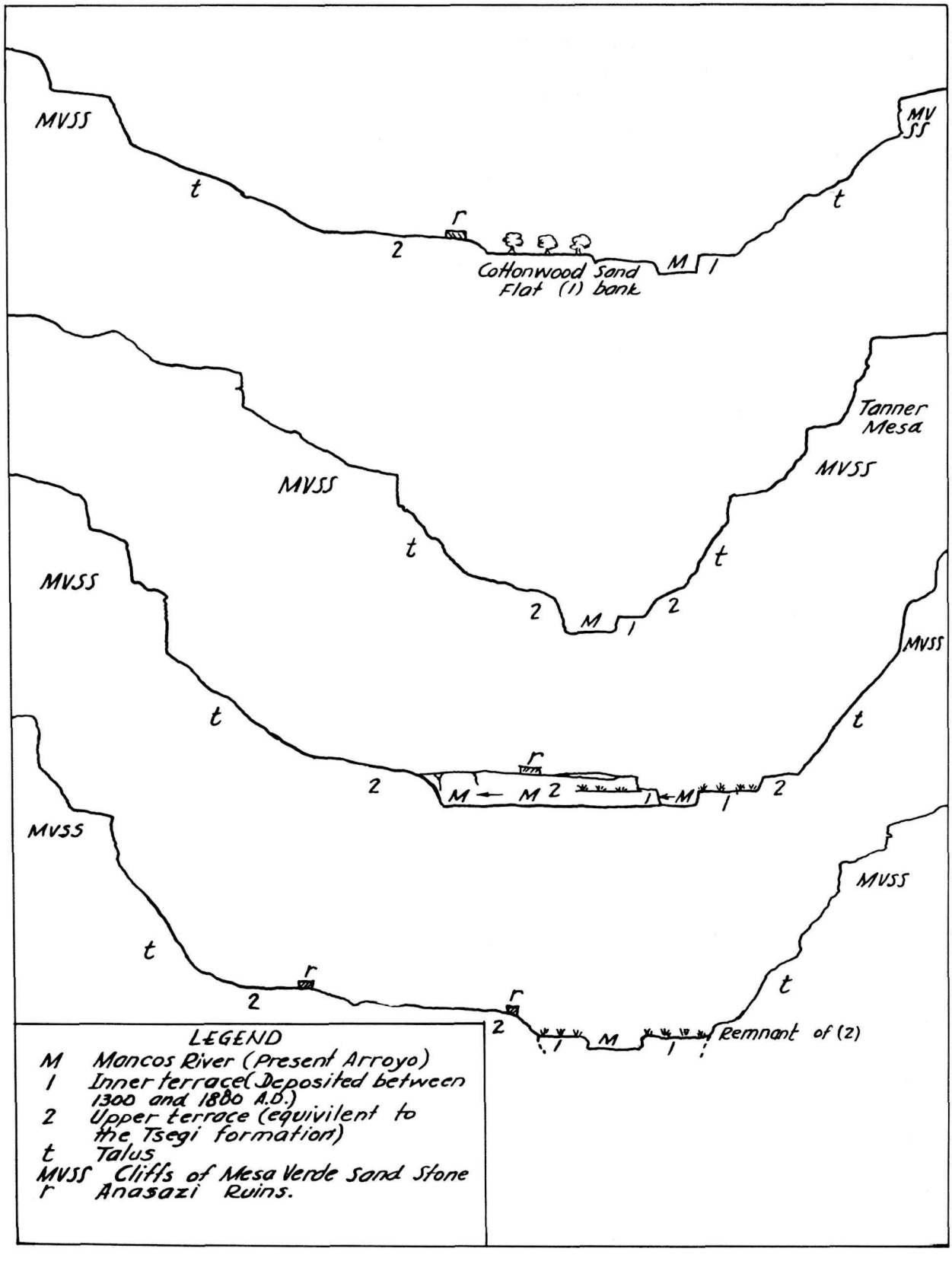


Fig. 61. Sections across Mancos Canyon (somewhat generalized; sketched, not measured).

form the terrace. The first (inner) terrace came into existence only after the Anasazi had left the area, and was deposited at some time between the erosion of the second terrace and the current period of arroyo cutting (which began, over the Southwest, about and after 1880). This corresponds to the sequence of events which has been demonstrated by Hack for northeastern Arizona.

The second terrace was largely eroded away along the entire south side of lower Mancos Canyon, only remnants being observable; this explains the lack of sites on the south side, except for the Homes Tower and whatever less conspicuous sites I failed to see. How many sites on either side of the river were totally removed by the previous epicycle of erosion can only be guessed at, both here and in other stream valleys in which the second terrace is well back from the present arroyo.

This epicycle of erosion, which left the second terrace, or Tsegi formation, in most of the stream valleys of the northern Southwest, can be most reasonably dated to circa A. D. 1300. It was probably caused by a drought which is believed from tree-rings to have occurred between 1276 and 1299. The evidence and reasoning for this assumption have been presented by Hack for northeastern Arizona; conditions in other districts seem from my own unsystematic observation as well as from the published papers of Kirk Bryan (Bryan 1929, 1941, and others), to support, or correlate with, Hack's entire theory.

An inference from the purely geological hypothesis is, that the abandonment of the entire San Juan drainage by the Anasazi about A. D. 1300, and perhaps also that of other districts by Anasazi and other Pueblos at the same time and within the next hundred years or so, was due to this period of extensive and extreme arroyo-cutting, comparable to and even exceeding the present or recent one (1880 to 1940, approximately), and to the consequent destruction of arable land and the lowering of the water table.

There are, however, a number of points which await explanation under the generally convincing and broadly acceptable hypothesis, that an intense and perhaps brief period of arroyo-cutting brought about the withdrawal of the Anasazi from the San Juan about A. D. 1300, and perhaps also of the western and southern Pueblos (Mogollon) from other areas successively between 1300 and 1400. The drought as such was probably not the direct cause anywhere, unless on such upland areas as the Mesa Verde. The suggestion that disease due to poor sanitation in crowded villages materially reduced the population (Colton 1936), even if applicable, would not explain the abandonment of entire regions.

Quite possibly, attacks of postulated nomad enemies--who would have been the Navajos or other Apaches, and possibly the Utes, in the northern Southwest; the Western Apache in east central Arizona and the Yavapai in the Verde Valley--also had something to do with the abandonments. Direct proof is lacking, but there are a few tantalizing indications (see Morris 1939, 42) and it is difficult to see how arroyo-cutting would directly affect the uplands of the Mesa Verde and certain other areas.

Several lines of thought--hardly of evidence--suggest the possible presence of Apache tribes and/or the Utes and Paiutes in the Southwest by the fourteenth century, which may have been a contributing factor in at least some areas (see Farmer 1942, 78-79; Huscher and Huscher 1942; Hurt 1942, 47). On the western frontier of the Pueblo area in central Arizona, very probably the Yavapai had something to do with the disappearance of the Sinagua.

The majority of the people of the Mesa Verde focus quite clearly went eastward when they left the eastern San Juan. Those of northeastern Arizona, and perhaps those in southeastern Utah, no doubt moved in to Hopi (see Brew 1946, 301-302)

Undated sites on the west side of Mt. Taylor, and east of Mt. Taylor on the Rio Puerco, suggest the move to the Rio Grande; it is confirmed by the appearance of black-on-white pottery obviously derived from Mesa Verde Black-on-white--some of it virtually indistinguishable--on the Rio Grande, in the Tiwa-Keres-Galisteo area, at the beginning of the fourteenth century (Mera 1935, 10, and unpublished information furnished by Stanley Stubbs of the Laboratory of Anthropology).

This is not surprising, as the upper Rio Grande had always been Anasazi in culture (circular kivas, gray ware and black-on-white pottery, crudely notched and full-grooved axes, flexed burial, lambdoid deformation, etc.). General correspondence can be seen between the historic and modern Rio Grande pueblos and the prehistoric Anasazi of the San Juan, especially in such important traits as the circular kiva. Similar correspondence is apparent, though tenuous, between the ethnographic Western Pueblos (see the ethnographic publications of the late Elsie Clews Parsons; and Hawley 1937)--Hopi, Zuni, Acoma; with matrilineal clans and rectangular kivas--and the prehistoric "Western Pueblo complex," or "developed Mogollon culture," of central Arizona.

More precise correlation of Mesa Verde and Rio Grande cultures, of the Anasazi and a modern tribal group, can be attempted. That the people of Keres language may be equated with Mesa Verde pottery, and Tanoans with Chacoan pottery, has been suggested (Mera 1935, 38-39). This hypothesis is based on two ideas which I find unacceptable: (1) that the glaze paint red ware of 1350 to 1700 was not introduced into the Rio Grande by migration, but was simply local imitation of trade material from the west; (2) that Chaco and Mesa Verde were different cultures, separate developments by people so distinct as to be of different linguistic stocks, rather than phases of the development of the same general culture by closely related peoples (see the discussion above concerning the relations between the Chaco and Mesa Verde branches).

Under another, wider hypothesis, likewise containing weak points but offering a reasonable general theory for the whole Pueblo area, an inessential but almost inescapable corollary is that the Keresans (and Zuni and the Hopi) are to be correlated culturally with the southern (so-called western) or upland or Mogollon division of

Pueblo culture, which is distinguished from the northern or Anasazi division by brown ware, rectangular kivas, the well-made 3/4 grooved axe (Reed 1951b), prevalence of extended inhumation, vertical occiptal cranial deformation (Reed 1949a); and the Tanoan-speaking groups, on the Rio Grande from Taos to Socorro, correlated broadly with eastern Anasazi (Reed 1946, 1948a, 1950).

More specifically, it is possible to suggest that the Tiwa dialects represent the original inhabitants of the Rio Grande area; that Towa (Jemez-Pecos) derives from either a Chacoan immigation or from the Largo-Gallina phase (suggested by Stanley Stubbs); and that Tewa speech is to be correlated with the Mesa Verde phase, or with both Chaco and Mesa Verde. In the second case, the Northern Tewa, who are still in place, represent Chacoan immigration (Jemez-Pecos being tentatively assigned to Largo-Gallina).

In any case, it is my belief that the Southern Tewa or Tanos of the Galisteo Basin are to be correlated with the immigration of people of Mesa Verde culture to the Rio Grande at just about A. D. 1300, bringing Mesa Verde-Galisteo Black-on-white. These were then the people who produced the so-called yellow-slip types of the upper Rio Grande (Glaze A Yellow and Glaze B, or I Yellow and II, actually a gray or white slip in most of the earlier type) by applying glaze paint to their Galisteo white-slipped pottery. And these are the people later generations of whom sparked the 1680 and 1696 revolts and then fled in large part to the Hopi country, where their descendants still live, and still speak Tewa, at Hano (Los Tanos) on First Mesa (Reed 1943a, 1943b, 1949b).

The people who built the little pueblos of Mancos Canyon, and those of the great cliff dwellings of the Mesa Verde, the great pueblo at Yucca House, the many ruins of the La Plata drainage, and the final occupation of Aztec and the Chaco Canyon, were, in any case, among the ancestors of certain of the modern Pueblo Indians of the Rio Grande in the district north and south of Santa Fe, New Mexico--possibly the Keres or else a Tanoan group, perhaps the Southern Tewa whose descendants now live mainly on First Mesa in the Hopi country. The culture and way of life of these contemporary Americans derives, without a major break throughout the Anasazi sequence, from the primitive pit house and gray ware phase of fourteen centuries ago.

BIBLIOGRAPHY

(Abbreviations of series are listed at the end of the bibliography.)

Anonymous
1927 Biographical Sketches and Letters of T. Mitchell Prudden, M.D., 1849-1924. New Haven.

Baldwin, Gordon C.
1939 The Material Culture of Kinishba. American Antiquity, Vol. 4, No. 4, pp. 314-327.

Bartlett, Katharine
1933 Pueblo Milling Stones of the Flagstaff Region and Their Relation to Others in the Southwest, a Study in Progressive Efficiency. MNA, Bulletin, No. 3.

1941 Appendix on skeletal remains, in McGregor 1941.

Beals, Ralph Leon, George W. Brainerd, and Watson Smith
1945 Archaeological Studies in Northeast Arizona. UCPAAE, Vol. 4, No. 1.

Bennett, Wendell C., and Robert M. Zingg
1935 The Tarahumara. University of Chicago Press.

Bessels, Emil
1876 The Human Remains Found near the Ancient Ruins of Southwestern Colorado and New Mexico. Bulletin of the Geological and Geographical Survey of the Territories, Vol. 3, No. 1.

Birdsall, W.R.
1892 The Cliff-dwellings of the Canyons of the Mesa Verde. American Antiquarian, Vol. 14, No. 3, pp. 123, 128.

Brand, Donald D., Frank C. Hibben, Florence M. Hawley, and Donovan Senter
1937 Tseh So. UNM, Bulletin, Anthropological Series, Vol. 2, No. 2.

Brew, John Otis
1936 Appendix C, Notes on Excavations at Alkali Ridge, Utah, in Martin 1939.

1946 Archaeology of Alkali Ridge, Southeastern Utah. PMP, Vol. 21.

Bryan, Kirk

1929 Flood-water Farming. Geographical Review, Vol. 19, No. 3, pp. 444-456.

1941 Pre-columbian Agriculture in the Southwest, as Conditioned by Periods of Alluviation. Annals of the Association of American Geographers, Vol. 31, No. 4, pp. 219-242.

Chapin, Frederick H.

1890 Cliff-dwellings of the Mancos Canyons. American Antiquarian, Vol. 12, No. 4, pp. 193-210.

1892 The Land of the Cliff-Dwellers. Boston.

Colton, Harold Sellers

1936 The Rise and Fall of the Prehistoric Population of Northern Arizona. Science, Vol. 84, pp. 337-343 (No. 3184).

1939 Prehistoric Culture Units and Their Relationships in Northern Arizona. MNA, Bulletin, No. 17.

1940 Notes on a Pottery type Called Lino Gray. American Antiquity, Vol. 5, No. 4, p. 338.

1941 Winona and Ridge Ruin, Part II. MNA, Bulletin, No. 19.

1943 The Principle of Analogous Pottery-types. American Anthropologist, Vol. 43, No. 2, pp. 316-320.

1946 The Sinagua. MNA, Bulletin, No. 22.

Colton, Harold S., and L. L. Hargrave

1937 Handbook of Northern Arizona Pottery Wares. MNA, Bulletin, No. 11.

Cosgrove, H.S. and C. R.

1932 The Swarts Ruin. PMP, Vol. 15, No. 1.

Croizat, Leon

1941 A Further Comment on Stability in Nomenclature. Science, Vol. 93 (No. 2405), pp. 109-110.

Cummings, Byron

1910 The Ancient Inhabitants of the San Juan Valley. University of Utah Bulletin, Vol. 3, No. 3, pt. 2.

Dutton, Bertha P.
1938 Leyit Kin. University of New Mexico, Albuquerque.

Farmer, Malcolm
1942 Navaho Archaeology of Upper Blanco and Large Canyons, Northern New Mexico. American Antiquity, Vol. 8, No. 1, pp. 65-79.

Fewkes, Jesse Walter
1909 Antiquities of the Mesa Verde National Park--Spruce-Tree House. BAE, Bulletin, No. 41.

1911 Antiquities of the Mesa Verde National Park--Cliff Palace. BAE, Bulletin, No. 51.

1916 The Cliff-ruins in Fewkes Canyon. In Hodge, F.W. (ed.), Holmes Anniversary Volume, Washington.

1916a A Sun Temple in the Mesa Verde National Park. Art and Archeology, Vol. 3, No. 6.

1917 Prehistoric Remains in New Mexico, Colorado, and Utah. SIMC, Vol. 66, No. 17.

1917a A Prehistoric Mesa Verde Pueblo and Its People. Annual Report of the Smithsonian Institution for 1916, pp. 461-487.

1918 Prehistoric Ruins in Southwestern Colorado and Southeastern Utah. SIMC, Vol. 68, No. 12.

1919 Prehistoric Villages, Castles, and Towers of Southwestern Colorado. BAE, Bulletin, No. 70.

1920 Field Work on the Mesa Verde National Park. In Explorations and Field Work of the Smithsonian Institution in 1919. SIMC, Vol. 72, No. 1, pp. 47-64.

1921 Field Work on the Mesa Verde National Park. In Explorations and Field Work of the Smithsonian Institution in 1920. SIMC, Vol. 72, No. 6, pp. 75-94.

1922 Archaeological Field Work on the Mesa Verde National Park. In Explorations and Field Work of the Smithsonian Institution in 1921. SIMC, Vol. 72, No. 15, pp. 64-83.

1923 Archaeological Field Work on the Mesa Verde National Park. In Exploration and Field Work of the Smithsonian Institution in 1922. SIMC, Vol. 74, No. 5, pp. 89-113.

Fewkes, Vladimir J.
1940 Methods of Pottery Manufacture. American Antiquity, Vol. 6, No. 2, pp. 172-173.

1941 The Function of Paddle and Anvil in Pottery-making. American Antiquity, Vol. 7, No. 2, pp. 162-164.

1942 Slip in Archaeological Pottery. American Antiquity, Vol. 8, No. 1, pp. 118-119.

Gabel, Norman E.
1944 Appendix on skeletal remains in Hall 1944.

Getty, Harry Thomas
1939 Appendix D, Tree-ring Dates, in Martin 1939.

Gillin, John Philip
1941 Archaeological Investigations in Central Utah. PMP, Vol. 17, No. 2.

Gillmor, Frances, and Louisa Wetherill
1934 Traders to the Navajo, the Story of the Wetherills of Kayenta. Cambridge.

Gladwin, Harold Sterling
1934 See Gladwin, Winifred and Harold S.

1937 Excavations at Snaketown, II, Comparisons and Theories. GPM, Vol. 26.

1942 Excavations at Snaketown, III, Revisions, GPM, Vol. 30.

1945 The Chaco Branch, GPM, Vol. 33.

Gladwin, Winifred and Harold S.
1934 A Method for Designation of Cultures and Their Variations. GPM, Vol. 15.

Gladwin, H. S., E. W. Haury, E. B. Sayles, and Nora Gladwin
1937 Excavations at Snaketown, I, Material Culture. GPM, Vol. 25.

Gorodzov, Vasilii Alexievich
1933 The Typological Method in Archaeology. American Anthropologist, Vol. 35, No. 1, pp. 95-102.

Guernsey, Samuel James
1931 Explorations in Northeastern Arizona. PMP, Vol. 12, No. 1.

Guernsey, S.J. and A.V. Kidder
1921 Basket-Maker Cave of Northeastern Arizona. PMP, Vol.18, No. 2.

Hack, John T.
1942 The Changing Physical Environment of the Hopi Indians of Arizona. PMP, Vol. 25, No. 1 (Reports of the Awatovi Expedition 1).

Hall, Edward Twitchell, Jr.
1944 Early Stockaded Settlements in the Governador, New Mexico. Columbia Studies in Archaeology and Ethnology, Vol. 2, No. 1.

Hargrave, Lyndon Lane
1932 Guide to Forty Pottery Types. . . . MNA, Bulletin, No. 1.

1935 Report on Archaeological Reconnaissance in the Rainbow Plateau Area. University of California Press, Berkeley.

1936 Notes on a Red Ware from Bluff, Utah. Southwestern Lore, Vol. 2, No. 2, pp. 29-34.

Haury, Emil Walter
1936 Some Southwestern Pottery Types, Series IV. GPM, Vol. 19.

1936a The Mogollon Culture of Southwestern New Mexico, GPM, Vol. 20.

1937 See Haury and Flora.

1938 Southwestern Dated Ruins: II. TRB, Vol. 4, No. 3.

1940 Excavations in the Forestdale Valley, East-central Arizona. University of Arizona, Social Science Bulletin, No. 12.

1945 Painted Cave, Northeastern Arizona. Amerind Foundation, Inc., Publications, No. 3, Dragoon, Arizona.

Haury, E. W., and I. F. Flora
1937 Basket Maker III Dates from the Vicinity of Durango, Colorado. TRB, Vol. 4, No. 1.

Hawley, Florence
1936 Field Manual of Prehistoric Southwestern Pottery-types. UNM, Anthropological Series, Vol. 1, No. 4.

1937 Pueblo Social Organization as a Lead to Pueblo History. American Anthropologist, Vol. 39, No. 3.

Heizer, Robert F., and F. Fenenga
1939 Archaeological Horizons in Central California. American Anthropologist, Vol. 41, No. 3, pp. 378-399.

Hill, Gertrude
1942 On Bone Daggers. Society of American Archeology, Notebook, Vol. 2, No. 3, p. 38.

Hodge, Frederick Webb
1920 Hawikuh Bonework. MAI, Indian Notes and Monographs, Vol. 3, No. 3, pp. 60-151.

Hoffmann, W.J.
1878 Report on the Chaco Cranium. ARGGS for 1876, pp. 451-457.

Holmes, William Henry
1878 Report on the Ancient Ruins Examined During the Summers of 1875 and 1876. ARGGS for 1876, pp. 383-408.

1886 Pottery of the Ancient Pueblos. BAE, Fourth Annual Report, for 1882-1883, pp. 265-358.

Hooton, Earnest Albert
1930 The Indians of Pecos Pueblo. PSE, Vol. 4.

Hurt, Wesley R.
1942 Eighteenth Century Navaho Hogans from Canyon de Chelly National Monument. American Antiquity, Vol. 8, No. 1, pp. 89-104.

Huscher, Betty and Harold A.
1942 Athapaskan Migration Via the Intermontane Region. American Antiquity, Vol. 8, No. 1, pp. 80-88.

1943 The Hogan Builders of Colorado. Southwestern Lore, Vol. 9, No. 2, pp. 1-92.

Ingersoll, Ernest
1928 Ruins in Southwestern Colorado. MAI, Indian Notes, Vol. 2, No. 5, pp. 183-206.

Ives, Ronald L.
1940 The Origin of Some Polished Stone Artifacts. American Antiquity, Vol. 6, No. 1, pp. 70-72.

Jackson, William H.
1876 Ancient Ruins in Southwestern Colorado. ARGGS for 1874, pp. 367-381.

1878 Report on the Ancient Ruins Examined in 1875 and 1877. Chapter 1 Ruins of Southwestern Colorado and Adjacent Territories. ARGGS for 1876, pp. 411-430.

Jeancon, Jean Allard
1922 Archaeological Research in the Northeastern San Juan Basin of Colorado During the Summer of 1921. State Historical and Natural History Society of Colorado, Denver.

Jeancon, J.A., and F.H.H. Roberts, Jr.
1923 Further Archaeological Research in the Northeastern San Juan Basin of Colorado During the Summer of 1922. Colorado Magazine, Vol.1, No. 1, pp. 10-36.

Judd, Neil Merton
1927 Archaeological Investigations in Chaco Canyon, New Mexico. In Exploration and Field Work of the Smithsonian Institution in 1926. SIMC, Vol. 78, No. 7.

Kidder, Alfred Vincent
1910 Explorations in Southwestern Utah in 1908. American Journal of Archaeology, Vol. 14, No. 3, pp. 337-359.

1924 Introduction to Southwestern Archaeology, PSE, Vol. 1.

1932 The Artifacts of Pecos. PSE, Vol. 6.

Kidder, A.V., and S.J. Guernsey
1919 Archaeological Explorations in Northeastern Arizona. BAE, Bulletin, No. 65.

Kidder, A.V., and Anna O. Shepard
1936 The Pottery of Pecos, Volume II. PSE, Vol. 7.

Kluckhohn, Clyde, Paul Reiter, and others
1939 Preliminary Report on the 1937 Excavations, Bc50-51. UNM, Anthropological Series, Vol. 3, No. 2.

Kroeber, Alfred Louis
1928 Native Culture of the Southwest. UCPAAE, Vol. 23, No. 9.

Lancaster, James Allen, and Don Watson
1943 Excavation of Mesa Verde Pit Houses. American Antiquity, Vol. 9, No. 2, pp. 190-198.

Leh, Leonard L.
1942 A Preliminary Report on the Monument Ruins in San Juan County, Utah. University of Colorado Studies in Social Sciences, Vol. 1, No. 3.

Li Chi
1943 The Prone Burials of Anyang. Studies in the Anthropology of Oceania and Asia. PMP, Vol. 20, pp. 134-148.

Martin, Paul Sidney
1929 The 1928 Archaeological Expedition of the State Historical and Natural History Society. Colorado Magazine, Vol. 6, No. 1, pp. 1-35.

1930 The 1929 Archaeological Expedition of the State Historical Society of Colorado. Colorado Magazine, Vol. 7, No. 1, pp. 1-44.

1936 Lowry Ruin in Southwestern Colorado. FMAS, Vol 23, No. 1.

1938 Archaeological Work in the Ackmen-Lowry Area, Southwestern Colorado, 1937. FMAS, Vol. 23, No. 2.

1939 Modified Basket Maker Sites, Ackmen-Lowry Area, Southwestern Colorado, 1938. FMAS, Vol. 23, No. 3.

1940 The SU Site, Excavations at a Mogollon Village, Western New Mexico, 1939. FMAS, Vol. 32, No. 1.

1943 The SU Site, Excavations at a Mogollon Village, Western New Mexico Second Season, 1941. FMAS, Vol. 32, No. 2.

Martin, Paul S., and Elizabeth Willis
1940 Anasazi Painted Pottery in Field Museum. Field Museum of Natural History, Anthropology Memoirs, No. 6.

McGregor, John Charles
1937 Winona Village, a XIIth Century Settlement with a Ball Court, Near Flagstaff, Arizona. MNA, Bulletin, No. 12.

1941 Winona and Ridge Ruin, Part 1. MNA, Bulletin, No. 18.

1941a Southwestern Archaeology. Wiley, New York.

Mead, Albert Davis
1939 The Species Complex in Biology and Education. Science, Vol. 90, pp. 241-296 (No. 2333).

Mera, Harry P.
1934 Observations on the Archaeology of the Petrified Forest National Monument. Laboratory of Anthropology, Technical Bulletin, No. 7. Santa Fe.

1935 Ceramic Clues to the Prehistory of North Central New Mexico. Laboratory of Anthropology, Technical Bulletin, No. 8. Santa Fe.

Morgan, Lewis Henry
1881 Houses and House-life of the American Aborigines. In, Contributions to North American Ethnology. U.S. Geographical and Geological Survey of the Rocky Mountain Region, Vol. 4.

Morgan, William Fellowes
1878 Description of a Cliff-house on the Mancos River of Colorado. American Association for the Advancement of Science, Proceedings, Vol. 27, pp. 300-306.

Morley, Sylvanus Griswold
1908 The Excavation of the Cannonball Ruin in Southwestern Colorado. American Anthropologist, Vol. 10, No. 4, pp. 596-610.

Morris, Earl Halstead
1919 The Aztec Ruin. APAMNH, Vol. 26, No. 1.

1919a Preliminary Account of the Antiquities of the Region Between the Mancos and La Plata Rivers in Southwestern Colorado. BAE, Annual Report 1914-1915, Vol. 33.

1921 The House of the Great Kiva at the Aztec Ruin. APAMNH, Vol. 26, No. 2.

1939 Archaeological Studies in the La Plata District, Southwestern Colorado and Northwestern New Mexico. Carnegie Institution, Publications, No. 519.

Neumann, Georg Karl
1942 Types of Artificial Cranial Deformation in the Eastern United States. American Antiquity, Vol. 7, No. 3, pp. 306-310.

Nordenskiold, Gustave
1893 The Cliff-dwellers of the Mesa Verde. Stockholm.

O'Bryan, Deric
1950 Excavations in Mesa Verde National Park, 1947-1948, GPM, No. 39.

Pepper, George H.
1920 Pueblo Bonito. APAMNH, Vol. 27.

Prudden, Theodore Mitchell
1903 The Prehistoric Ruins of the San Juan Watershed in Utah, Arizona, Colorado, and New Mexico. American Anthropologist, Vol. 5, No. 2, pp. 224-288.

1914 The Circular Kivas of Small Ruins in the San Juan Watershed. American Anthropologist, Vol. 16, No. 1, pp. 33-58.

1918 A Further Study of Small Ruins in the San Juan Watershed. American Anthropological Association, Memoirs, Vol. 5, No. 1.

Reed, Erik Kellerman
1939 Preliminary Study of Pottery from Room 7, Wupatki Pueblo. Southwestern Monuments Report for March, 1939, Coolidge, Arizona (mimeographed).

1942 Implications of the Mogollon Concept. American Antiquity, Vol. 8, No. 1, pp. 27-31.

1943a The Origins of Hano Pueblo. El Palacio, Vol. 50, No. 4. pp. 73-76.

1943b The Southern Tewa Pueblos in the Historic Period. El Palacio, Vol. 50, Nos. 11, 12.

1944a Pottery-types of the Manuelito District. American Antiquity, Vol. 10, No. 2, pp. 161-172.

1944b The Abandonment of the San Juan Region. El Palacio, Vol. 51, No. 4, pp. 61-74.

1944c Late Redware Intrusives in the Mesa Verde Focus. Southwestern Lore, Vol. 9, No. 4, pp. 7-9.

1944d The Place of Citadel Polychrome in San Juan Orangeware. Southwestern Lore, Vol. 9, No. 4, pp. 5-7.

1946 Distinctive Features and Distribution of the San Juan Anasazi. SJA, Vol. 2, No. 3, pp. 295-305.

1948a The Western Pueblo Archaeological Complex. El Palacio, Vol. 55, No. 1, pp. 9-15.

1948b Dating of Early Mogollon Horizons, El Palacio, Vol. 55, No. 12, pp. 382-386.

1949a The Significance of Skull Deformation in the Southwest. El Palacio, Vol. 56, No. 4, pp. 106-119.

1949b Sources of Upper Rio Grande Culture and Population. El Palacio, Vol. 56, No. 6, pp. 163-184.

1950 Eastern-central Arizona Archaeology in Relation to the Western Pueblos. SJA, Vol. 6, No. 2, pp. 120-138.

1951a Turkeys in Southwestern Archaeology. El Palacio, Vol. 58, No. 7, pp. 195-205.

1951b Types of Stone Axes in the Southwest. Southwestern Lore, Vol. 17, No. 3, pp. 45-51.

Retzius, Gustave

1893 Appendix: Human Remains from the Cliff-dwellings of the Mesa Verde. In Nordenskiold 1893.

Rinaldo, John

--- (See Martin 1939, 1940, 1943.)

1941 Conjectures on the Independent Development of the Mogollon Culture. American Antiquity, Vol. 7, No. 1, pp. 5-19.

Roberts, Frank H.H., Jr.

1923 (See Jeancon and Roberts.)

1925 Report on Archaeological Reconnaissance in Southwestern Colorado in the Summer of 1923. Colorado Magazine, Vol. 2, No. 2, pp. 1-80.

1929 Shabikeshchee Village. BAE, Bulletin, No. 92.

1930 Early Pueblo Ruins in the Piedra District, Southwestern Colorado. BAE, Bulletin, No. 93.

1931 The Ruins at Kiatuthlanna, Eastern Arizona. BAE, Bulletin, No. 100.

1932 The Village of the Great Kivas on the Zuni Reservation, New Mexico. BAE, Bulletin, No. 111.

1935 A Survey of Southwestern Archaeology. American Anthropologist, Vol. 37, No. 1, pp. 1-33.

1936 A Survey of Southwestern Archaeology. Smithsonian Institution, Annual Report, 1935, pp. 507-533.

1937 Archaeology in the Southwest. American Antiquity, Vol. 3, No. 1, pp. 3-31.

1939 Archaeological Remains in the Whitewater District, Eastern Arizona, Part I, House-types. BAE, Bulletin, No. 121.

1940 Archaeological Remains in the Whitewater District, Eastern Arizona, Part II, Artifacts and Burials. BAE, Bulletin, No. 126.

Rouse, Irving

1939 Prehistory in Haiti, a Study in Method. Yale University, Publications in Anthropology, No. 21.

1941 Culture of the Ft. Liberte Region, Haiti. Yale University, Publications in Anthropology, No. 24.

Roys, Lawrence

1936 An Introduction to the Study of Southwestern Masonry. In Martin 1936.

Seltzer, Carl

1936 New Light on the Racial History of the Southwest Area. American Journal of Physical Anthropology, Vol. 21, Supplement to No. 2, p. 17.

1944 Racial Prehistory in the Southwest and the Hawikuh Zunis. PMP, Vol. 23, No. 1.

Shepard, Anna Osler

1936 See Kidder and Shepard, 1936.

1939 Appendix B, Technology of La Plata Pottery. In Morris 1939.

Stallings, William S., Jr.

1937 Southwestern Dated Ruins: I. TRB, Vol. 4, No. 2, pp. 3-5.

Stewart, Thomas Dale

1937 Different Types of Cranial Deformity in the Pueblo Area. American Anthropologist, Vol. 39, No. 1, pp. 169-171.

1940 Appendix B: Skeletal Remains. In Roberts 1940.

Taylor, Walter Willard
1948 A Study of Archaeology. American Anthropological Association, Memoir, No. 69.

Toulouse, Joseph Harrison, Jr.
1938 See Kluckhohn and Reiter 1938.

Vivian, R.G.
n.d.a. Additional Investigations of the Three-Walled Structure at Pueblo del Arroyo. Unpublished manuscript on file at National Park Service, Region 3 Headquarters, Santa Fe, New Mexico.

n.d.b. The Three-C Site. Unpublished manuscript on file at National Park Service, Region 3 Headquarters, Santa Fe, New Mexico.

Von Bonin, Gerhardt
1936 Skeletal Material from the Lowry Area. In Martin 1936.

1937 Cranial Deformity in the Pueblo Area. American Anthropologist, Vol. 39, No. 4, pp. 720-721.

White, Leslie A., ed.
1942 Lewis H. Morgan's Journal of a Trip to Southwestern Colorado and New Mexico, June 21-August 7, 1878. American Antiquity, Vol. 8, No. 1, pp. 1-26.

Whittemore, Mary
1939 See Kluckhohn and Reiter.

Woodbury, Richard B.
1939 See Kluckhohn and Reiter.

Abbreviations

APAMNH	Anthropological Papers of the American Museum of Natural History (New York).
ARGGS	Annual Report of the U. S. Geological and Geographical Survey of the Territories (Gov't. Printing Office, Washington, D. C.).
BAE	Bureau of American Ethnology (Smithsonian Institution, Washington, D. C.).
FMAS	Field Museum of Natural History, Anthropological Series (Chicago).
GPM	The Medallion Papers, Gila Pueblo (Globe, Arizona).
MAI	Museum of the American Indian, Heye Foundation (New York).
MNA	Museum of Northern Arizona (Flagstaff).
PMP	Papers of the Peabody Museum of American Archaeology and Ethnology (Cambridge, Mass.).
PSE	Papers of the Southwestern Expedition (Department of Archaeology, Phillips Academy, Andover, Mass.). Yale University Press.
SIMC	Smithsonian Institution Miscellaneous Collections (Washington, D. C.).
SJA	Southwestern Journal of Anthropology (Albuquerque).
TRB	Tree-Ring Bulletin, published by the Tree-Ring Society (University of Arizona, Tucson).
UCPAAE	University of California Publications in American Archaeology and Ethnology.
UNM	University of New Mexico (Albuquerque).

APPENDIX A

LIST OF SPECIMENS CATALOGUED

Site 1

1/1 small disc of red stone, from the refuse.

1/2 incomplete crude stone axe, from the surface.

1/3 pottery bowl, unbroken, Mancos Black-on-white (with Burial 1).

1/4 incomplete crude stone axe, from the surface.

1/5 bone splinter awl, at depth 3 in. in refuse.

1/6 point of bone awl, in floor of Room C.

1/7 crude stone axe, at depth 6 in. in refuse.

1/8 sandal form (stone slab), at depth 8 in. in refuse.

1/9 fragment of shell bracelet, from the refuse.

1/10 tiny bone awl, from the refuse.

1/11 fragment of perforated bone tool, from the refuse.

1/12 bone splinter awl, from the refuse.

1/13 crude notched stone knife, from the refuse.

1/14 incomplete stone axe, from the refuse.

1/15 short thick bone awl, from old ground level close to Room C.

1/16 bone weaving tool, from depth 5 in. in refuse.

1/17 blade of small stone axe of good quality, in top 8 in. of refuse.

1/18 handled bowl or large dipper, incomplete, Tusayan Black-on-red (near Burial 2 at depth 4 in.).

1/19 mano from floor of Room H.

1/20 restorable pottery jar, indented corrugated, from the fill of Room H in fallen roof material.

1/21 small disc of red stone, from depth 20 in. in refuse.

1/22 bone tube, from depth 12 in. to 15 in. in refuse.

1/23 fragment of crystalline selenite from Room G.

1/24 pot-polishing pebble, from within 6 in. of floor of Room E.

1/25 restorable pottery bowl, Mancos Black-on-white, corrugated exterior, from depth 16 in. to 24 in. in refuse.

1/26 restorable pottery ladle, Mancos Black-on-white, from depth around 15 in. in refuse.

1/27 incomplete crude stone axe, from top 8 in. of refuse.

1/28 crude stone hoe, adz, or flat axe, from top 8 in. of refuse.

1/29 small polished stone blade, between 8 in. and 16 in. in refuse.

1/30 mano from top 8 in. of refuse.

1/31 incomplete stone hammer, from the refuse.

Site 3

3/1 bone tube, from the Mesa Verde refuse.

3/2 pottery pipe, from Slab Cist G, depth about 2 ft., associated with Specimen 6.

3/3 slate tablet fragment from Room C.

3/4 restorable pottery bowl, La Plata Black-on-white. No associations.

3/5 small cylinder of gray pottery from fill of Pit-room F, wall top level, 2 ft. 6 in. below present surface.

3/6 restorable plain gray jar from structure C, at depth 1 ft. 8 in. to 2 ft.

3/7 bone tube, from the Mesa Verde refuse.

3/8 fragment of bone awl, from south recess of Kiva N, about 1 ft. 6 in. above floor.

3/9 incomplete mano, from south recess of Kiva N, about 1 ft. 6 in. above floor.

3/10 small polished stone blade, south recess of Kiva N, within 6 in. of floor.

3/11 small polished stone blade, south recess of Kiva N, within 6 in. of floor.

3/12 stone slab, from floor of bench at N.W. corner of south recess, Kiva N.

3/13 ladle handle, Mancos Black-on-white, with pollets south recess, Kiva N within 1 ft. 6 in. of floor.

Site 4

4/1 bone splinter awl, from fill of Room E.

4/2 bone splinter awl, from floor of Room E.

4/3 five tiny disc beads (one turquoise, four white stone) from near floor, Room B.

4/4 large crude stone axe, from floor of Room A.

4/5 small polished stone notched blade, found in fill of Room M associated with deer bones, red ware sherd, and corrugated sherds.

4/6 axe blade of good quality, from floor of Room C.

4/7 splinter awl, from floor of Room E.

4/8 restorable large pottery jar, indented-corrugated, in pit in N.E. corner of Room G covered with a hexagonal sandstone slab, mouth of jar 5 in. below floor.

4/9 bone tube, of unknown provenience.

4/10 sherds of unfired pottery, from floor of Room G.

4/11 fragment of bone tube, of unknown provenience (discarded).

4/12 tiny bit of unworked malachite, of unknown provenience (discarded).

4/13 piece of crystalline calcite, from Room M.

4/14 flat metate, from floor of Room G, associated with 4/10.

4/15 stone slab, from Room E near floor.

4/16 flat metate, from floor of Room G.

4/17 flat metate, from floor of Room G.

4/18 shaped small sandstone boulder, of uncertain provenience.

4/19 shaped small sandstone boulder, of uncertain provenience.

4/20 bone tube, from fill of Room D.

4/21 pair of arrowshaft smoothers of soft friable sandstone, from floor of Room F.

4/22 crude stone axe, from kiva fill within 1 ft. below bench level.

4/23 bone awl from kiva fill, 6 in. below bench.

4/24 restorable large pottery jar, indented corrugated, set into floor in S.W. corner of Room F.

4/25 incomplete stone axe, from kiva fill about 1 ft. below bench.

4/26 point of bone awl, from kiva fill about 1 ft. below bench.

4/27 polishing pebble, from kiva fill about 1 ft. below bench.

4/28 small stone disc, from vault in floor of Room F.

4/29 bone weaving tool, from within 6 in. of floor of Kiva J.

Site 7

7/1 pottery ladle, Mancos Black-on-white (with Burial 1).

7/2 bone splinter awl, from refuse near Burial 1.

7/3 (no specimen with this designation)

7/4 bone chisel, from kiva fill between 2 ft. and 3 ft. from surface.

7/5 bone dagger of large awl fill, between 2 ft. and 3 ft. from surface.

7/6 large sherd of Mancos Black-on-white pottery bowl (with Burial 5).

7/7 bone dagger or large awl, from fill of Kiva C.

7/8 small crude stone axe, from fill of Kiva C.

7/9 crude plain gray pottery cup (with Burial 6).

7/10 small pottery bowl, Mancos Black-on-white (with Burial 6).

7/11 fragment of bone tool, from the refuse.

7/12 large sherd of Mancos Black-on-white bowl (with Burial 9).

7/13 small chip of obsidian (discarded).

7/14 sherds of Mancos Black-on-white ladle, from near Burial 3.

7/15 sherds of indented-corrugated jar, not restorable (with Burial 3).

7/16 large bowl sherd of Mancos (?) Black-on-white (with Burial 3).

7/17 large bowl sherd of so-called McElmo Black-on-white, found on bench of Kiva C.

7/18 hexagonal flat sandstone object, found on bench of Kiva C.

7/19 mano, from the adjoining Pueblo I site.

Site 8

8/1 very crude notched stone tool, found on the eroding surface.

8/2 blade fragment of stone axe of superior quality, eroding surface.

Site 11

11/1 restorable plain gray pottery jar, Rosa Smoothed (with Burial 1).

11/2 incomplete pottery bowl, Rosa Black-on-gray, (with Burial 1).

11/3 perforated bone awl from refuse, 1 ft. 6 in. below bulldozer swath.

11/4 very crude notched stone tool, from west end of refuse.

11/5 broken bone tube, incomplete, from southwest portion of refuse.

11/6 bone awl, from east-west trench, associated Pueblo I sherds

11/7 stone blade or chopper, from a mixed cut.

11/8 crude stone chopper, from a mixed cut.

11/9 bone awl, from a mixed cut.

11/10 incomplete crude stone axe, from a mixed cut.

11/11 fragment of turkey leg bone from which tube or tubes cut, provenience uncertain.

11/12 incomplete mano, from a mixed cut.

11/13 incomplete metate, from Pueblo I refuse.

11/14 incomplete metate, from Pueblo I refuse.

11/15 incomplete metate, from Pueblo I refuse.

11/16 stone chopper associated with 11/13 to 15.

11/17 mano from eroded Pueblo I structure.

11/18 pottery bowl, Chaco 1 Black-on-white (with Burial 2).

11/19 small pottery dipper, Chaco 1 Black-on-white, found near Burial 2.

11/20 bowl sherd, Piedra Black-on-white (with Burial 2)

11/21 shell bracelet fragment, from Pueblo I refuse.

11/22 bone awl, from Pueblo I refuse.

11/23 crude stone axe, from Pueblo I refuse.

11/24 black-on-white pottery bowl of uncertain type (with Burial 3).

11/25 gray pottery pitcher (with Burial 3)

11/26 small gray pottery pitcher (with Burial 3).

11/27 rim sherd of coil-neck gray pottery jar, found associated with Burial 2.

11/28 incomplete crude stone axe, from bulldozed refuse.

Site 17

17/1 worked sherd of Bluff Black-on-red (surface find).

Site 18

18/1 worked sherd of Mesa Verde Black-on-white (surface find).

APPENDIX B

SKELETAL REMAINS FROM MANCOS CANYON, COLORADO

By T. D. Stewart
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U. S. National Museum
July, 1942

Most of the skeletal material from the Southwest that has reached eastern museums has been in a state of good preservation. Physical anthropologists without field experience in this area, therefore, tend to lose sight of the fact that considerable deteriorated remains sometimes are discarded in the field. Witness, for example, Roberts' recent report (1939, 1940) on his work in the Whitewater District of eastern Arizona where he reports recovering only 19 out of 150 burials. Undoubtedly, in such cases the archeologist must decide between the prospect of spending much time and patience in removing and preserving these bony specimens that contribute little to his cultural picture, or, out of practical necessity, discarding these remains in order to accomplish his other investigations. Usually in following the latter course the archeologist has the support of the physical anthropologists who want to work only with adequate series of whole specimens.

There are other considerations in this matter. Probably no physical anthropologist would want to undertake the restoration of all the skeletons that could be recovered. Also, if in view of the fragmentary nature of the material and the presence of cranial deformity, few anthropometric measurements could be obtained, the only results would be the observations on sex, age, etc.. And even these observations, because of various factors affecting the selection of burial site, might be of uncertain demographic value.

On the other hand, the expectation as a rule is for the oldest skeletal remains to be less well preserved. Consequently, if we are to know anything about the physical type of the people who carried, let us say, the Basket Maker III culture, it will be necessary to save all remains found with such cultural associations. Only in this way, too, as I have pointed out elsewhere (Stewart 1937), will we be able to work out the temporal and geographical distributions of cranial deformity--essentially a cultural trait.

The present collection of skeletal remains from Mancos Canyon can be characterized as very fragmentary. Nevertheless, being from the late Basket Maker and early Pueblo cultural periods, and from a portion of the Southwest for which we have scanty information (compare Stewart 1940, 154), it is important to record pertinent observations on this material. I feel that here the most significant observation pertains to the presence or absence, and type of, cranial deformity, and accordingly this point is given especial emphasis.

Observations

The individual specimens first will be listed in cultural sequence and secondarily by serial order of the collector's numbers. The cultural placement of the specimens, as supplied by Reed, attempts to compromise with the varying use of the Pecos classification.

Collector's Number	Description	Age	Sex	Deformity
	Basket Maker III			
3/1	Skull and few bones	Adult	Female	Undeformed
	Late Basket Maker or Early Pueblo I			
11/3	Posterior part of skull, lower jaw, and left femur	Near 6 yrs.	?	Lambdoid[1]
	Pueblo I[2]			
11/2	Skull, lower jaw, and long bones	Adult	Male	Atypical lambdoid
	Pueblo II (or IIIa)[3]			
1/1	Skull, lower jaw and few bones	Near 4 yrs.	?	Lambdoid
1/2	Skull fragments and few bones	8 to 10 yrs.	?	Lambdoid
1/3	Lower jaw and pair fragment femora	Near 6 yrs.	?	?
1/4	Frag. parietals and frontal	Under 2 yrs.	?	Lambdoid
7/1	Fragments of skull and long bones	Adult	?	?
7/2	Skull, lower jaw and few bones	Under 2 yrs.	?	Lambdoid
7/6	Posterior part of skull	Probably adult	?	Lambdoid
7/7	Skull, lower jaw and few bones	Near 2 yrs.	?	Lambdoid
7/8	Frontal bone	Under 2 yrs.	?	?

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[1]In this type the plane of flattening is inclined 50^{o} to 60^{o} to the horizontal.

[2]Included in the collection from Site 11, and perhaps attributable to Pueblo I, is a fragmentary adult female mandible.

[3]Miscellaneous additional bones from Site 1, without specific cultural associations, include a right maxilla, left tibia, left femur, and left (?) fibula, all possibly from the same individual--a child near six years of age. Included also is a fragmentary small left tibia, possibly adult. The child's tibia and femur show traces of periostitis.

The adult Skulls 3/1 and 11/2 listed above are shown in lateral view in Fig. 62. No. 3/1 not only is undeformed, but as reconstructed is extremely narrow, giving a cranial index of 61.1. Although this narrowing is due in part to post-mortem changes, it is largely original, as witness the minimum frontal diameter of 84 mm.. The vault also was probably quite high, being now near 140 mm. . Of the face measurements the following are considered accurate:

Upper face ht.	65 mm.	Nas. ht.	49 mm.
Orb. ht.	31 mm.	Nas. br.	25 mm.
Orb. br.	35 mm.	Nas. ind.	51.- mm.
Orb. index	88.6 mm.	Upper alv. arch ht.	55 mm.
		Upper alv. arch br.	63 mm.
		Upper alv. arch ind.	114.5 mm.

Number 11/2, on the other hand, is quite broad on account of the deformity, and this is reflected in the minimum frontal diameter of 98 mm.. The details of the deformity are problematical, because most of the occiput and posterior parietals are missing. Admittedly the reconstruction of these parts may not be adequate, and this in turn may account for the appearance of the deformity, which is intermediate between true lambdoid and occipital.

The following face measurements are probably accurate:

Nasal ht.	52 mm.	Orb. ht.	36 mm.
Nasal br.	28 mm.	Orb. br.	40.5 mm.
Nasal index	53.8 mm.	Orb. index	88.9 mm.

This individual is nearly edentulous and probably was of advanced age at the time of death. A characteristic age change is the arthritis observable in the elbow joint. This has reached a point at which bone proliferation prevents full extension.

The child's Skull 1/1, also pictured in Fig. 62, shows a rather typical lambdoid deformity. Although to the untrained eye this flattening may seem to resemble the natural lambdoid depression of the undeformed individual illustrated in the same plate, this is by no means the case. Skull 1/1 has a cranial index of about 91, and consequently is very broad in contrast to 3/1 when seen from above. I have shown them in lateral view because the types are easier to distinguish from this angle.

The relative sizes of some of the children in this series, as implied by the assessed ages in the table above, may be shown also by the maximum long-bone lengths:

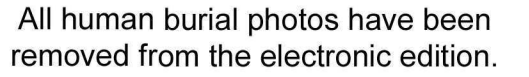


Fig. 62. Lateral views of three skulls from sites in Mancos Canyon, Colorado.
Top: Child 1/1, Mancos period, lambdoid deformity.
Middle: Adult, male 11/2, Pueblo I, lambdoid deformity.
Bottom: Adult female 3/1, Basket Maker III, no artificial deformation.
(Rephotographed from plate prepared by T. D. Stewart.)

Collector's Number	Humerus R.	Humerus L.	Radius R.	Radius L.	Ulna R.	Ulna L.	Femur R.	Femur L.	Tibia R.	Tibia L.
7/2	94	94	-	79	-	88	-	-	-	-
7/7	-	116	-	-	-	-	-	-	-	-
1/1	120	-	93	-	105.5	-	-	-	-	-
11/3	-	-	-	-	-	-	-	191	-	-
misc. 1	-	-	-	-	-	-	-	-	-	158
1/2	210	-	-	-	-	-	-	-	-	-

The youngest of these children, No. 7/2, has a patent frontal fontanelle,[4] and only the deciduous incisors erupted. Next is No. 7/7 with a closed fontanelle, and all but the second deciduous molars erupted. No. 1/1 has the full deciduous set of teeth, but the exoccipitals are ununited. No. 11/3 has the exoccipitals united and the first permanent molar beginning to erupt. Finally, the miscellaneous bones from Site 1, if belonging together, are at the stage of M^1 full eruption.[5] Judging by size, No. 1/2 may be in a still more advanced stage.

Summary

The collection of skeletal remains from four sites in Mancos Canyon consits probably of 15 individuals, of which 6 are adults and 9 subadults. The youngest are infants under 2 years of age. The cultural periods represented are Basket Maker III to Pueblo II (or IIIa).

In only nine cases is the skull sufficiently complete to permit an estimate of the presence or absence, and type of, deformity. It is noteworthy, however, that only one of these nine skulls is free from defomrity, and this one is from the oldest represented cultural period--Basket Maker III.

The eight deformed skulls, with one possible exception (11/2), show the lambdoid type of deformity. The exception is an adult skull in which the posterior parts are damaged badly. However, as reconstructed, the deformity seems to be intermediate between the lambdoid and occipital types; or, in other words, the plane of flattening forms an angle of about 70° with the horizontal instead of 50° to 60° as in the lambdoid type, or 90° as in the occipital type.

These deformed specimens bear out the fact, already established (for example, see see Stewart 1940) that the lambdoid deformity was present in the earliest Pueblo period. Moreover, as would be expected, the head had already received this shaping in early infancy.

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[4]Nos. 1/4 and 7/8 also show patent fontanelles.

[5]No. 1/3 also is near this stage of eruption.

The physical type of the undeformed skull is of particular interest, and it is unfortunate that this specimen has suffered post-mortem distortion. It seems certain, however, that this skull was hyperdolichocranic and had a high vault. These features accord with the Basket Maker type as we know it (compare Stewart 1940, Table 2).

Aside from the present series and isolated skulls from southwestern Colorado, the majority of which show lambdoid deformity, I know of only two other series from this region that can be assigned to cultural periods. One of these is from the Lowry Ruin and is placed at late Pueblo II to early Pueblo III (Martin 1936). The other is from the Piedra District and is placed at Pueblo I (Roberts 1930).

All of the specimens recovered at the Lowry Site have the lambdoid deformity. The Piedra skulls, on the other hand, are undeformed or show very slight occipital flattening.[6] One of these undeformed skulls (348,966) has a cranial index of 71.0 and a mean height index of 87.0. This would seem to be of the same general type as the undeformed specimen from Mancos Canyon.

To those familiar with the cultural picture of southwestern Colorado, these suggestive facts may be of more interest even than they are to physical anthropologists. But in any event, it should be clear that many important details depend upon the recovery of skeletal remains from the earliest periods. And this means fragmentary skeletons.

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[6]These 8 specimens--all that were recovered from the 104 burials investigated--have never been described; they bear the U.S.N.M. Nos. 348,965-971.

Literature Cited

Martin, Paul S.

1936 Lowry Ruin in Southwestern Colorado. Field Museum of Natural History, Anthropological Series, Vol. 23, No. 1, (Pub. No. 356).

Roberts, Frank H.H., Jr.

1930 Early Pueblo Ruins in the Piedra District, Southwestern Colorado. Bureau of American Ethnology, Bulletin 96.

1939 Archeological Remains in the Whitewater District, Eastern Arizona; Part 1, House Types. Bureau of American Ethnology, Bulletin 121.

1940 Archeological Remains in the Whitewater District, Eastern Arizona; Part 2, Artifacts and Burials. Bureau of American Ethnology, Bulletin 126.

Stewart, T.D.

1937 Different Types of Cranial Deformity in the Pueblo Area. American Anthropologist, Vol. 39, No. 1, pp. 169-171.

1940 Skeletal Remains from the Whitewater District, Eastern Arizona. Bureau of American Ethnology, Bulletin 126, Appendix B, pp. 153-166.

Addendum

Observations in the field by the excavator indicate lambdoid deformation also of 7/1, adult, probably female, although the skull could not be restored to confirm this. It will be noted that in the other two cases where only a question-mark is given under deformity, the back of the skull is missing. Burials 7/3, 4, 5 were fragmentary infants, Mancos Black-on-white association. Burial 11/1, adult male, accompanied by Rosa pottery, had been damaged by bulldozing, and no definite statement can be made on cranial deformation. EKR, 1943.

APPENDIX C

DENDROCHRONOLOGICAL NOTES

By E. T. Hall, Jr.

Tree-ring material from Mancos Canyon sites excavated by E. K. Reed, examined June 4, 1942. (Reviewed and checked by T. L. Smiley, Tree-Ring Laboratory. University of Arizona, Summer, 1950.)

Site 3		
Kiva H	(Mesa Verde)	19 Juniper
Pit House F	(Basket Maker)	
	southwest corner	10 Juniper
	southeast corner	4 Juniper
	northwest corner	3 Juniper
		7 Cottonwood or aspen*
	floor	12 Juniper
		9 Aspen*
		2 Pinyon (EKR 1, 2)
Slab Room G	(Basket Maker)	1 Juniper
Site 17	(Mancos Black-on-white)	
Refuse		2 Juniper
		2 Oak*
		2 Pinyon (EKR 3, 4)
Site 1	(Mancos Black-on-white)	
Structure A		1 Juniper
Structure B		3 Juniper
		4 Pinyon (EKR 5, 6; two discarded)
Room C, outside N.W. corner		1 Pinyon (EKR 7)
Room H		1 Juniper
		3 Pinyon (EKR 8, 9, 10)
Site 4	(Mancos-McElmo)	
Room B, floor		1 Juniper
		1 Pinyon (EKR 15)
Room E		1 Pinyon (EKR 13)
Room F, assoc. Specimen 4/24		1 Pinyon (EKR 11)
Room K, floor		3 Pinyon (EKR 14; two discarded)
Room M		1 Pinyon (EKR 12)
Firepit O		1 Oak*

*Sent to the Forest Products Laboratory, U. S. Department of Agriculture, Madison, Wisconsin, for species identification.

Site 7 (Mancos Black-on-white)

Refuse	1 Juniper
	3 Pinyon (EKR 16, dupl.)
Bottom of refuse	4 Juniper
Room B, floorpit	Deciduous?*
Room B, floor	1 Juniper

Site 3, Room F, floor

EKR 1, pnn fr, ch 35 mm[1]
EKR 2, pnn fr, ch 23 mm

Site 17

EKR 3, pnn fr, ch
EKR 4, pnn fr, ch

Site 1, Structure B

EKR 5, pnn fr, ch 22 mm
EKR 6, pnn fr, ch 19 mm
2 small frs discarded

Room C outside N.W. corner

EKR 7, pnn fr, ch 15 mm

Room H

EKR 8, pnn fr, ch 33 mm--IDR-1132, ODR-1192, abs. none, est. B.D. 1192+x[2]
EKR 9, pnn fr, ch 18 mm--IDR-1098, ODR-1185, abs. 1107, est. B.D. 1185+x[2]
EKR 10, pnn fr, ch 12 mm-- IDR-1144, ODR-1192, abs. none, est B.D. 1192+x[2]

Site 4, Room F assoc. Specimen 4/24

EKR 11, pnn fr, ch 40 mm--IDR-870, ODR-993, est. bark date 993 x[3]

Room M

EKR 12, pnn 1/2s ch 10 mm

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[1]Tentative date by Hall, not confirmed by Smiley.

[2]Definite date by Hall, confirmed by Smiley.

[3]Additional date obtained by Smiley, checked by A.E. Douglass. In this case the "x" is probably large: "I believe it is far from the outside and that many rings are gone" (letter of July 31, 1951 from T.L. Smiley).

Room I

EKR 14, pnn fr, ch 22 mm

Room B

EKR 15, pnn fr, ch 15 mm

Room E

EKR 13, pnn fr, ch 18 mm

Site 7, Refuse

EKR 16, pnn fr, ch 30 mm

APPENDIX D

VEGETAL REMAINS

Report 222 of the Ethnobotanical Laboratory of the Museum of Anthropology, University of Michigan

By Volney H. Jones

Material received: June 5, 1942

Report issued: July 31, 1942

Received from:
Institution: National Park Service, Santa Fe Office
Individual: Erik K. Reed, Regional Archaeologist

Collected by: Reed

Where collected: Along Mancos River

When collected: 1942

Site or tribe:

Site number:

Culture and period: Basket Maker and early Pueblo

Collection data:

Nature and condition of material:

Disposition of specimens: Pipe (3291) returned; others retained

Reference to publications:

Description:

Original No. "3/2 pottery pipe."

Laboratory No. 3291. A tubular pottery pipe said to be from a Basket Maker III slab room. This pipe still contained a heavy cake or dottel.

This dottel is made up, of course, of ash, gums, and resins, etc. from the material smoked in the pipe, and therefore, shows no structure or tissue of the smoking material. Any identification of it

structure of tissue of the smoking material. Any identification of it would have to be on the basis of its chemical composition. We are not equipped or prepared to make chemical analyses.

R. B. Dixon and J. B. Stetson Jr. published a short article under the title "Analysis of Pre-Columbian Pipe Dottels" in the American Anthropologist, Vol. 24, No. 2, 1922, pp. 245-246 in which they reported the attempt to analyze dottels and cake from pipes from Basket Maker sites. The analyses were negative for nicotine. The conclusions drawn are that either the material was not tobacco, or that if tobacco, the nicotine content had disappeared in the course of time. The experiment was, therefore, inconclusive and does not tend to encourage further such studies.

Orig. No. "3 F floor, corncob."
Lab No. 3292. A charred corncob from a Basket Maker III pit house. Broken somewhat in shipping.

This cob is 3.5 cm. in length but does not appear to be complete. It is distinctly elliptical in cross-section, the greatest diameter being 2 cm. and the least 1.4 cm. . Anasazi corncobs are characteristically elliptical. There were 14 rows of kernels. Judging by the small size of the cob and the closeness of the kernel facets, the kernels must have been of very small size.

There is little basis for suggesting the type of corn, but as a guess we should say that this was of a small-kerneled flint corn.

Orig. No. "site 7, charred corncob."
Lab. No. 3293. Said to be from Pueblo II or early Pueblo III context.

Four more or less complete segments and a number of fragments of charred corncobs. None of these is over 3.4 cm. in length and none is complete.

Two of the segments and some of the fragments seem to be from cobs similar to that described under No. 3292 above. The largest is 1.6 cm. in diameter, and not so distinctly elliptical. The row number in these specimens is 12, rather than 14 as above, but nevertheless might well be of the same variety.

The other two segments and others of the fragments appear to be of a different variety of corn. The cobs are more angular in outline and have only 10 rows of kernels. The cobs are slender, being only about 1.2 cm. in diameter. The kernels were broader and more widely spaced than on the cobs above.

Orig. No. "Mancos Canyon Site 1, corncobs from refuse."
Lab. No. 3294.

A. Described on envelope as from general digging about 1 ft. 6 in. in depth. This is a segment of a corncob about 3 cm. long and apparently not complete. It is 1.4 cm. in diameter and circular in cross-section. It had 12 rows of kernels of rather small size.

B. Described as from Level E, depth 1 ft. to 1 ft. 3 in. A smaller cob segment 2 cm. in length and 1 cm. in diameter, formerly having 12 rows of kernels. It is similar to A in every respect except that it is smaller.

These two segments are distinguishable from either of the two kinds described above.

Summary

These corncobs are all of small size and represent varieties of corn smaller than those customarily grown by Southwestern Indians at present. The cobs can readily be separated by eye into three kinds, and these groups can be verified by dimensions, row number and spacing of kernels. These groups probably represent horticultural varieties which are distinct. We cannot say what types of corn are represented (all could be of the same type) and cannot arrange them in any evolutionary sequence.

APPENDIX E

FAUNAL REMAINS

Report 163161 of the U.S. National Museum

Identified by Raymond W. Gilmore, September 9, 1944

Site 1 "general," 1st sack of V

Deer (Odocoileus heminous), big individual

scapula	1
lumbar vertebra	1
thoracic vertebra	4
vertebrae fragments	5
radius	1
astragalus	1
phalange	2
rib fragments	4
metapodial ("worked")	1

Black-tailed jack rabbit (Lepus californicus)

1st lumbar vertebra	1
humerus	1
pelvic fragment	1
ulna	1

Cottontail rabbit (Sylvilagus auduboni?)

left innominate	1
mandible fragment	1
humerus	1
radius	1

White-tailed prairie dog (Cynomys gunnisoni–identification of this species based on slight difference of bone from that of C. ludovicianus, and present range of gunnisoni)

humerus	1

Pocket gopher (Thomonys perpallidus–identification of this species based on present day range)

tibia	1

Unidentified	1
Bird bones	59

Site 1, "food bones general" sack 2 of F

Mountain sheep (Ovis canadensis),	2 indiv.
distal fragment humerus	1
head of rib	1
neural spine on thoracic vertebra	1
Mule deer (Odocoileus hemionus)	
metatarsal ("worked")	1
astragalus	2
cubo-navicular	1
metacarpal	1
ulna	1
rib fragment	1
Dog (Canis familiaris)	
canine tooth	1
Black-tailed jack rabbit (Lepus californicus)	
fragment mandible	1
fragment scapula	1

White-tailed jack rabbit (Lepus townsendii--specific identification based on slight characters of radius, and present range of species)

humerus	1
ulna	1
femur	1
rib	1
mandible fragment	1

Cottontail rabbit (Sylvilagus auduboni--specific identification based on present range of species)

angle of mandible	1
fragments of pelvis	2
fragments of tibia	1
fragments of femur	3
fragments of scapula	2
fragments of humerus	1
radius	1
ulna	1

Prairie dog (Cynomys gunnisoni--identification of species based on slightly small size and present range)

mandible	1
tibia	1
fragment fibula	1
fragment humerus	1

Ground squirrel (Citellus variegatus--identification of species based on fact that variegatus is only large ground squirrel in region today)

fragment of mandible	1

Pocket gopher (Thomomys perpallidus--specific identification based on pattern of M^1)

unidentified fragments	11

Bird bone fragments 63

Site 3, "two small lots to be separately listed"

"4-J. Food bones"

Mountain sheep (Ovis canadensis)

metatarsal	1
lumbar vertebra	2

(too big for dom. sheep, but the metatarsal does not conform perfectly with mountain sheep. Not antelope or deer)

Black-tailed jack rabbit (Lepus californicus)

tibia	3

Bird bones 8

Site 3-F

Bird bones 4

Site 3, Kiva H; south recess

Mountain sheep (Ovis canadensis--bones too big for domestic sheep and conform well with large mountain sheep, though fragment of radius has a process not seen on any other animal)

fragment scapula (base)	1
fragment ulna (head)	1
fragment radius (head)	1

Site 4

Mountain sheep (Ovis canadensis)

fragment scapula	1
fragment tibia	1

Antelope (Antilocapra americana)

fragment scapula	1

Dog (Canis familiaris), or Coyote (Canis latrans)

fragment radius	1

Beaver (Castor canadensis)

rib	2

Cottontail rabbit (Sylvilagus auduboni--specific determination based on maxilla, probable association of bones and distribution of this species today)

fragment tibia	3
fragment maxilla	1
fragment mandible	1
fragment pelvis	1
fragment scapula	1
metapodial	1

Wood rat (Neotoma cinerea--species determination based on mandible and probable association of other bones)

mandible	1
fragment femur	2
fragment humerus	1

Unidentified fragments	4
Bird Bones	25

Site 7

Mountain sheep (Ovis canadensis)

fragments rib	2
fragments lumbar vertebra	1
fragment ulna	1
fragment maxilla embryo	1
phalanx	1
fragment unidentified	1

Large deer (Odocoileus virginianus)--ilium more characteristic of virginianaus than mule deer (O. hemionus)

fragments pelvis (ilium)	1
fragments pelvis (pubis)	1
premolar 3-4	1

Prairie dog (Cynomys gunnisoni?)

fragment humerus	1

Black-tailed jack rabbit (Lepus californicus)

fragment pelvis	1
fragment tibia	1

Site 11

Deer (crf. mule deer, Odocoileus hemionus--specific identification based on large size of bones)

fragment occiput of skull	1
fragment distal humerus	1
fragment squamosal of skull	1
fragment proximal metatarsal	1
fragment radius-ulna	1
fragment acetabulum of pelvis	1
fragment distal tibia	1
astragulus	2
calcaneum	1

Jack rabbit (Lepus californicus)

fragment of skull	1

Coyote (Canis latrans--not dog, nor wolf, matches almost perfectly with coyote)

mandible fragments	3
thoracic vertebra (young animal)	1

Mountain sheep (Ovis canadensis)

fragment proximal humerus (young animal)	1

Report 163161

Identification of Bird Bones

By Herbert Friedmann

Site 1, "general" first sack of V 1

Wild turkey, (Meleagris gallopavo)

humerus	1 complete	11 fragments
coracoid	1 complete	5 fragments
skull		2 fragments
synsacrum		5 fragments
femur	1 complete	
tarsometatarsus	1 complete	3 fragments
tibiotarsus		7 fragments
vertebra	2 complete	
scapula		2 fragments
radius		6 fragments
ulna		5 fragments
carpometacarpal		1 fragment
phalanges	2 complete	

Site 1, sack 2 of F

American raven, (Corvus corax sinuatus)

carpometacarpal

Wild turkey, (Meleagris gallopava)

humerus	1 complete	6 fragments
ulna		14 fragments
coracoid		6 fragments
scapula	1 complete	2 fragments
radius		8 fragments
vertebra	1 complete	
tibiotarsus		1 fragment
mandible		3 fragments
skull		1 fragment
rib		1 fragment
carpometacarpal		1 fragment

Site 1, sack 2 of F, 1/A (fire vault or barbecue pit)

Wild turkey (Meleagris gallopavo)

humerus		1 fragment
ulna		1 fragment
tibiotarsus		1 fragment
vertebra	2 complete	
phalanges	1 complete	

Site 3, 4-J

Wild turkey (Meleagris gallopavo)

tarsometatarsus	1 fragment
carpometacarpal	1 fragment
eternum	1 fragment
scapula	1 fragment
tibiotarsus	2 fragments
radius	2 fragments

Site 3, 3-F

Wild turkey (Meleagris gallopavo)

humerus	1 fragment
radius	1 fragment
tibiotarsus	2 fragments

Site 4

Wild turkey (Meleagris gallopavo)

humerus	2 fragments
tibiotarsus	5 fragments
coracoid	3 fragments
scapula	2 fragments
radius	1 fragment
vertebra	1 fragment
phalanges	1 fragment

Site 7

Wild turkey (Meleagris gallopavo)

humerus	2 complete	2 fragments
ulna	1 complete	2 fragments
tibiotarasus		7 fragments

femur	1 complete	
coracoid	1 complete	
carpometacarpal		1 fragment
radius	2 complete	1 fragment
rib		1 fragment

Discussion

By Erik K. Reed

A. Birds

1. American raven (one bone from Site 1--precise association unknown and possibly a surface find).

Common in Arizona (Swarth 1914, 46) and the mountainous region of New Mexico (F.M. Bailey 1928, 467), the raven is a summer resident of Mesa Verde National Park (Watson, n.d.). Raven feathers are, I believe, among those used by modern pueblos.

Previous archeological occurrences have been noted at Winona (McGregor 1941, 258) and other sites near Flagstaff, Arizona, as Nalakihu and Wupatki (Hargrave 1939); at Betatakin and Kietsiel and at Awatovi (Hargrave 1939); at San Marcos (Reed excavations 1940, identification by Friedmann in 1950); at Pecos Pueblo in New Mexico (Kidder 1932, 196); at Ventana Cave (Haury et al. 1950, 152), and at Snaketown in southern Arizona (Gladwin et al. 1937, 156), as well as at Aztec (Steen 1939).

2. Merriam turkey (from Basket Maker III to Pueblo III, several individuals in Mancos period remains at Site 1 and 7).

Now very rare in the Arizona mountains (Swarth 1914, 23) and not now found in the Mesa Verde, the wild turkey is still common in many sections of New Mexico, mainly the forested mountains. This would be specifically, or, I should say, subspecifically, the Merriam turkey (Meleagris gallopavo merriami). The eastern subspecies (M. silvestris) ranges from the Atlantic seaboard and the Gulf of Mexico coast only into eastern Colorado and the northeastern corner of New Mexico.

Turkey bones are commonly found only in pre-Spanish sites allover the Anasazi area, from Basket Maker times on, sometimes in quantity (for example, 77 individuals represented by bones found at Kietsiel: Hargrave 1939). Turkey remains are notably less abundant south of the Anasazi proper; rare in Sinagua (central Arizona) and Hohokam (southern Arizona) sites: see Reed 1951.

B. Mammals

1. Mountain sheep (in Mancos and Mesa Verde associations; two individuals at Site 1, one at Site 3, one or two at Site 4, one at Site 7, one at Site 11. Found in Basket Maker contexts in northern Arizona: compare Guernsey and Kidder 1921, 44, 45, 50, 99).

The bighorn of the high Colorado Rockies, Ovis canadensis canadensis, formerly extended south as far as the region of Santa Fe, New Mexico (Vernon Bailey 1931, 16); and was near Mancos Canyon in the La Plata and San Juan ranges to the northeast.

Mountain sheep remains from Chaco Canyon, New Mexico, however, have been identified as probably O. canadensis texiana, the Texas bighorn of the Upper Sonoran zones of arid desert ranges far to the southeast (Hibben in Brand et al. 1937, 105). The bones of mountain sheep found at a major ruin excavated in the Mimbres Valley, southwestern New Mexico, also were referred to this subspecies, by Glover M. Allen (Cosgrove 1932, 5).

Other finds of mountain sheep remains in Southwestern sites generally have not been identified beyond species, except that some of the material from southern Arizona has been referred to one of the desert bighorns, O. canadensis gaillardi (for example, Gladwin et al. 1937, 156). The time of appearance of the bighorn in the Southwest is indicated in Haury et al., 1950.

2. Pronghorn (one scapula, Site 4--Mancos-Mesa Verde context).

In a plains and open valley (lower Sonoran) habitat, the American antelope was widely distributed in suitable areas of the Southwest. Pronghorns disappeared about 1883 in the San Juan Valley just south of Mancos Canyon (Bailey 1931, 22). The Montezuma Valley looks like fairly typical antelope range. Bones are often in archeological sites, never in quantity approaching deer and rabbit.

3. Black-tailed (mule) deer (one or two individuals from Site 1--Mancos period, one from Site 11).

Widespread in mountainous areas of the Southwest, in forested upland habitat (Upper Sonoran-Transition), the mule deer is commonly found in archeological sites from Basket Maker on.

4. White-tailed (Virginia) deer (pelvic bones of one individual, Site 1--Mancos).

Formerly common in eastern New Mexico, as far west as the Sangre de Cristo range just east of Taos and Santa Fe (Bailey 1931, 35), of Plains (stream thickets, etc.) and Upper Sonoran habitat, the Virginia deer, if this is really O. virginianus macrourus, is here 300 miles west of its known historic range. Gilmore qualified his identification by specifying that the ilium is more like virginianus than like hemionus.

On the north, the range of the Virginia white-tail extends through South Pass, Wyoming into only the northeasternmost corner of Utah (Barnes 1927, 165). In southeastern New Mexico, virginianus is mapped by Bailey as ranging just west, as well as east, of the Guadalupes.

Still farther south, a different subspecies of white-tail, carminis, the small "flagtail," is found in the Chisos Mountains of West Texas (Borell and Bryant 1942), but is not reported from New Mexico. The similarly small Sonora white-tail, O. couesi, ranging northeast to the Datil Mountains region of western New Mexico, is likewise quite distinct from macrourus.

Archeologically, bones of the Virginia deer are reported, along with mule deer, from Pecos Pueblo, within the range of O. virginianus macrourus; and "probably" in central Utah sites, not too far southwestward from its historic extent into Utah; also from Hawikuh in western New Mexico and from early sites in southwestern New Mexico (Martin 1940, 1943; Martin and Rinaldo 1949).

These instances of deer reported as viginianus in southwestern New Mexico might be couesi, if small, and that at Hawikuh might conceivably be; but the Mancos Canyon deer is far distant. The Sonora deer (couesi), has been specifically reported archeologically only from well within its present lower Sonoran desert habitat (Withers 1944; Haury et al. 1950).

Addendum: white-tailed deer is identified by the Chicago Museum of Natural History among animal bones in Mesa Verde National Park collection, November, 1949.

5. Black-tailed (Texas) jack rabbit (one or two individuals from Site 1, two or three from Site 4, one represented at Site 11--Mancos-Mesa Verde).

An animal of the lower Sonoran open brush country, but ranging up through juniper and pinyon even into the yellow pines, subspecies texianus is common over most of western New Mexico and in Arizona, southeastern Utah, and southwestern Colorado, as well as Chihuahua and trans-Pecos Texas. Jack rabbit bones are very common in archeological sites.

6. White-tailed jack rabbit (several bones, probably one individual, Site 1--Mancos).

The Plains-Prairie and Great Basin form of the American hare, the white-tail, is found east of the Pecos in New Mexico (Bailey 1931, 47; see also Warren 1910; Vorhies and Taylor 1933; Pratt 1935; Hall 1945), and in the high country of western New Mexico, but, like the white-tailed deer, not in the Navajo country, though recorded in the San Luis Valley and Taos area. The species occurs in Utah south almost to the vicinity of Monticello and Alkali Ridge. This is not a great distance from Mancos Canyon. The jack rabbit bones from Alkali Ridge sites are, however, all reported as californicus texianus (Brew 1946, 12), and so are those from 1947-48 excavations on the Mesa Verde (O'Bryan 1950, 133). L. alleni, the Antelope jack rabbit of the Sonora Desert is found archeologically in the Papagueria (Withers 1944; Haury et al. 1950), and is reported--no doubt by error for townsendii--in addition to californicus, in ninth century sites in the Ackmen-Lowry district (Martin et al. 1939, 430). Both black-tailed (californicus) and white-tailed (townsendii) jack rabbits are found widely in Nevada, Colorado, and Utah; but alleni is not (Pratt 1935, 347; Hall 1945).

7. Cottontail rabbit (two or three individuals, Site 1; probably a single individual at Site 4--Mancos period and/or Mesa Verde).

Species identification is based partly on present range. The subspecies warreni, the Colorado cottontail, is native to the Four Corners area, in upper Sonoran habitat. Both this type and the Rocky Mountain cottontail, S. nuttalli pinetis, are reported in the Chaco Canyon sites (Dutton 1938, 65; Brand et al. 1937, 65, 102-104). Only warreni is listed from Alkali Ridge (Brew 1946, 12) and from the Mesa Verde itself (O'Bryan 1950, 133).

8. Rock squirrel (a mandible fragment, Site 1--Mancos period or surface find).

Identification is based on range and size. The rock squirrel, or Say's ground squirrel, Citellus (Otosphermophilus) variegatus grammurus (the Sciurus grammurus of Say, 1823) is common and widespread in the Southwest, generally in upper Sonoran habitat. The only other specific archeological records I find, however, are: at the SU site in southwestern New Mexico (Martin 1943, 23-25), at Ventana Cave (Haury et al. 1950, 151), in a Cohonina site south of the Grand Canyon (McGregor 1951), among Frijoles Canyon group M material from Bandelier National Monument identified by W. H. Burt of the University of Michigan (Turney 1948, ms.), and in sites on the Mesa Verde (O'Bryan 1950, 132).

9. White-tailed or Zuni prairie dog (one or two individuals at Site 1, one at Site 7--Mancos period).

Identification as C. gunnisoni (probably subspecies zuniensis) of the Four Corners region rather than C. ludovicianus (one subspecies, the Great Plains prairie dog, east of the Pecos; another, the Arizona form, from the Pecos west, but south of the Navajo country) is based partly on present range. A sciurid of upper Sonoran habitat, the prairie dog is common in Anasazi sites (missing at Alkali Ridge). Prairie dog skins were much used by Basket Makers (Guernsey and Kidder 1921).

10. Bushy-tailed wood rat (Site 4, probably one individual--Mancos-Mesa Verde period).

The pale subspecies arizonae occurs in the vicinity of the Four Corners (Bailey 1931, 191; Barnes 1927, 126) in upper Sonoran habitat. Other subspecies of N. cinerea are more distant, although N. lepida and N. mexicana, not bushy-tailed, range into this general area. Wood rats are reported from archeological sites near Flagstaff (McGregor 1941, 256; McGregor 1951, 114) and in Chaco Canyon (N. mexicana fallax, (Brand et al. 1937, 65; Dutton 1938, 65), and at the Turkey Foot Ridge Site (Martin and Rinaldo 1950, 350), Ventana Cave and Snaketown, Frijoles Canyon (Turney 1948, ms.), San Marcos (N. albigula, identified by H. W. Setzer, U. S. National Museum in material from excavations by E. K. Reed, 1940: letter of September 13, 1950, from Remington Kellogg, Director) and Pecos (Kidder 1932, 195).

11. Golden pocket gopher (Site 1, probably more than one individual--Mancos period or later self-intrusion).

The pocket gopher is found in the upper Sonoran zone in sandy valleys and sandstone cliffs. Identification as a Four Corners species (presumably the local subspecies, aureus) is based partly on range. Remains found at Chaco Canyon are referred to Thomomys perpallidus aureus (Brand et al. 1937, 64, 105; Dutton 1938, 65). Pocket gopher bones at Alkali Ridge are not identified beyond genus.

12. Beaver (two ribs, no doubt of a single individual, Site 4--Mancos-Mesa Verde period).

Living along wooded streams at various elevations, the subspecies frondator occupies the Colorado River drainage (Bailey 1931, 211; Barnes 1927, 109; Pratt 1935, 345). Beavers are known in the Farmington area on the San Juan nearby. Archeologically reported at Tuzigoot (Caywood and Spicer 1935, 67), Pueblo Bonito (one jaw: Brand 1937, 64), Pecos (Kidder 1932, 195), Group M in Frijoles Canyon (Turney 1948, ms.), at Mantle Cave in Castle Park on the Yampa, and sites in central Utah (Gillin 1941, 46). Beaver jaws and teeth at Riana on the Chama are identified as Castor canadensis mexicanus (Hibben 1937).

13. Dog and coyote (a dog tooth from Site 1, and two radius fragments of dog or coyote from Site 4--Mancos-Mesa Verde. Definite coyote remains from Site 11--wide period range).

The domestic Canis familiaris of Old World origin is known archeologically in the Southwest from Basket Maker on; remains of the coyote, Canis latrans, of arid upper Sonoran habitat, also occur, less often definitely identified.

No bones of hawks,* owls,* golden eagle,* (compare Kluckhohn 1939, 150), and goose, quail and small passerine birds were found. Mammals which likewise might be expected in this context and have been found occasionally in sites of comparable ecological situation include: elk,* squirrel,* badger,* porcupine,* woodchuck,* fox, wolf,* bear, lynx (bobcat),* lion,* and bison (found archeologically in several sites in Arizona, well west of the historic range of the American bison).

Bear and mountain lion appear to be infrequent in archeological sites (see Kluckhohn 1939, 149-150). Raccoons and smaller carnivores of the weasel-otter-mink group are also very rare. Fox bones are perhaps less infrequent, but are not very common.

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*Found at Alkali Ridge (Brew 1946, 12-13).

Tufted-eared (Abert) squirrels and spruce (Fremont) squirrels, both mountain-forest animals occurring, for example, in the Chuskas, apparently are not found in Anasazi sites, although one instance of Sciurus aberti is reported from the Flagstaff area. An unspecified tree squirrel, Sciurus sp., is identified from Frijoles Canyon (Turney 1948, ms.).

The muskrat is reported only from Tuzigoot, from Snaketown, from Jemez Cave, and from sites in central Utah; the Sonora otter apparently is not found archeologically at all.

Still smaller mammals--chipmunks, mice (but see Hibben 1937), kangaroo mice, shrews, etc.--seem to be recovered but seldom in excavations (but see McGregor 1941, 256). Some of them are not worthwhile food sources, but a fat chipmunk would be a toothsome morsel. Probably the small and fragile bones do not survive well.

Mammals found in the Mancos Canyon sites fall into ecological groups as follows (broad association by "life zone" rather than biome or specific biotic community):

High mountain (primarily Canadian zone): mountain sheep.

Exclusively yellow-pine forest (transition zone): none.

Pinyon-juniper (upper Sonoran): mule deer, rock squirrel, wood rat.

Open country of upper Sonoran and down into Lower Sonoran: pronghorn, jack rabbit, cottontail, prairie dog, pocket gopher.

Strictly of the lower Sonoran desert, not entering the pinyon and juniper belt to any extent: none.

The beaver lives along flowing wooded streams at various elevations. Except perhaps for the bighorn of the high mountains, this can be considered a typical Upper Sonoran faunal assemblage, normal to the present landscape of Mancos Canyon and corresponding to the present fauna of the San Juan region (Brand 1937, 47-58; Brew 1946, 13).

References Cited

Bailey, Florence M.
1928 Birds of New Mexico. Washington.

Bailey, Vernon
1931 Mammals of New Mexico. U.S. Dept. of Agri., Biol. Survey, North American Fauna, No. 53.

Barnes, Claude T.
1927 Utah Mammals. University of Utah, Bulletin, Vol. 17, No. 12.

Borell, Adrey E., and Monroe D. Bryant
1942 Mammals of the Big Bend Area. University of California Publication in Zoology, Vol. 46, No. 1.

Brand, D. D., et al.
1937 Tseh So, A Small House Ruin. University of New Mexico, Bulletin, 308 (Anthropological Series Vol. 2, No. 2).

Brew, J.O.
1946 Archaeology of Alkali Ridge, Southeastern Utah. Peabody Museum Papers, XXI.

Caywood, Louis R., and E.H. Spicer
1935 Tuzigoot. Coolidge, Arizona (mimeographed).

Cosgrove, H.S., and C.B.
1932 The Swarts Ruin. Peabody Museum Papers, Vol. 15, No. 1.

Dutton, Bertha P.
1938 Leyit Kin. University of New Mexico, Albuquerque.

Gillin, John
1941 Archaeological Investigations in Central Utah. Peabody Museum Papers, Vol. 17, No. 2.

Gladwin, H.S., et al.
1937 Excavations at Snaketown. Gila Pueblo Medallion Papers, Vol. 25.

Guernsey, S.J., and A.V. Kidder
1921 Basket Maker Caves of Northeastern Arizona. Peabody Museum Papers, Vol. 8, No. 2.

Hall, E.R.
1945 Mammals of Nevada. University of California, Berkeley.

Hargrave, L. L.
1939 Birdbones from Abandoned Indian Dwellings in Arizona and Utah. The Condor, Vol. 41, No. 5, pp. 206-210.

Haury, E. W., et al.
1950 Ventana Cave. University of New Mexico Press.

Hibben, Frank
1937 See Brand, D. D., et al. 1937.

Kidder, Alfred V.
1932 The Artifacts of Pecos. New Haven.

Kluckhohn, Clyde, et al.
1939 Preliminary Report on the 1937 Excavations, Bc 50-51. University of New Mexico, Albuquerque.

Martin, Paul S., et al.
1939 Modified Basket Maker Sites, Ackmen-Lowry Area. Field Museum of Natural History, Anthropological Series, Vol. 23, No. 3.

1940 The SU Site. . . . Field Museum of Natural History, Anthropological Series, Vol. 32, No. 1.

1943 The SU Site. . . second season. Field Museum of Natural History, Anthropological Series, Vol. 32, No. 2.

1949 Cochise and Mogollon Sites. . . . Chicago Natural History Museum, Fieldiana; Anthropology, Vol. 38, No. 1.

1950 Sites of the Reserve Phase. Chicago Natural History Museum, Fieldiana; Anthropology, Vol. 38, No. 2.

McGregor, John C.
1941 Winona and Ridge Ruin. Museum of Northern Arizona, Bulletin, No. 18.

1951 The Cohonina Culture of Northwestern Arizona. University of Illinois Press, Urbana.

O'Bryan, Deric
1950 Excavations in Mesa Verde National Park, 1947-1948. Gila Pueblo Medallion Papers, Vol. 39.

Pratt, Henry S.
1935 Manual of the Vertebrates of the United States. Philadelphia.

Reed, Erik K.
1951 Turkeys in Southwestern Archaeology. El Palacio, Vol. 58, No. 7.

Steen, Charlie R.
1939 Excavations of Two Rooms in the Northwest Corner of Aztec Ruin, November-December, 1938. (Typewritten report to the National Park Service.)

Swarth, H. S.
1914 A Distributional List of the Birds of Arizona. Cooper Ornithological Club, Pacific Avifauna, No. 10, Hollywood.

Turney, John F.
1948 An Analysis of the Material Taken from a Section of Group M of the Cliffs, Frijoles Canyon, Bandelier National Monument. Unpublished M. A. Thesis, 1938, Adams State College, Alamosa, Colorado.

Vorhies, Charles T., and Walter P. Taylor
1933 The Life Histories and Ecology of Jackrabbits, Lepus alleni and Lepus californicus ssp., in Relation to Grazing in Arizona. University of Arizona Agricultural Experiment Station, Technical Bulletin, No. 49, pp. 471-587. Tucson.

Warren, Edward R.
1910 The Mammals of Colorado. New York.

Watson, Don
n. d. Unpublished checklist of birds observed in Mesa Verde National Park, based on observations by Park Archeologist Watson. National Park Service, Berkeley.

Withers, Arnold M.
1944 Excavations at Valshni Village, a Site on the Papago Indian Reservation. American Antiquity, Vol. 10, No. 1, pp. 33-47.

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